Title
Moving Beyond Test Scores: A Study on How to Improve High Performing Non-Title I High Schools

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Publication Date
2012

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA

Los Angeles

Moving Beyond Test Scores:

A Study on How to Improve High Performing Non-Title I High Schools

A dissertation submitted in partial satisfaction of the

requirements for the degree of Doctor of Education

by

Chad Ellwood Mabery

2012

ABSTRACT OF THE DISSERTATION

Moving Beyond Test Scores:

A Study on How to Improve High Performing Non-Title I High Schools

by

Chad Ellwood Mabery

Doctor of Education

University of California, Los Angeles, 2012

Professor Richard L. Wagoner, Co-Chair

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Standardized test scores continue to the ultimate measure of school success. With $14 billion in annual federal funds directed towards low SES or Title I schools, the stakes are high. Policy-makers are dangling grants, takeover, closure, and everything in between for schools, all based on test scores. For non-Title I schools, a different story is being plays out. Student demographics – the greatest predictor of academic achievement – plays in their favor. Judged by the test scores from all socioeconomic areas, non-Title I high schools appear to be consistently successful. On the surface, there appears to be no impetus to improve student learning. Yet, disaggregation of achievement data found minimal improvement in academic achievement during the last 12 years in non-Title I high schools. Furthermore, the relationship between student demographics and academic achievement leaves no quick fixes for non-Title I

high schools. This study was designed to examine the nature of potential relationships between a set of academic variables – rigor, connectedness, and climate – and academic achievement in non-Title I high schools. Data that represents these three academic variables were selected from an analysis of past literature. A factor analysis was utilized to establish valid and representative scores for academic rigor, school connectedness, and school climate. A regression analysis was then run between the independent variables and API score, while controlling for a set of student demographics, to determine what significant influence each variable had on student achievement. This study recommends seven resiliency skill development strategies for non-Title I high schools to improve academic achievement. Resiliency theory has been well-documented in schools and students that overcame social and economic challenges. This study suggests that even in high schools with fewer economic and demographic challenges, resiliency and connectedness was still important, and might be one of the few factors educators in these schools can influence to improve student achievement.

The dissertation of Chad Ellwood Mabery is approved.

Todd M. Franke

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University of California, Los Angeles

2012

DEDICATION

For my loving family,

Maggie, Emma, Jordan, Bumpster, and Roxy.

Here’s to rest of our lives!

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ACKNOWLEDGEMENTS

First and foremost, I must thank my wife Maggie, who changes lives as a teacher, but is an even more amazing mother and wife. We started the ELP with a 6-month old and finished with two beautiful and adorable 2- and 4-year old girls. She is the true leader of our family.

I would like to thank my committee chairs, Dr. Richard Wagoner and Dr. Eugene Tucker, and my committee members, Dr. Todd Franke and Dr. Christine Christie, for their valuable input in the process of this dissertation. The depth and strength of this study is a product of the diverse, dedicated, and giving nature of the UCLA ELP professors. Thank you to Linda Rose. Your continued care, support, and drive to make the ELP the best learning experience possible is humbling and inspiring.

To Cohort 17, your passion and selflessness inspires me to be better today than I was yesterday. I am also very much appreciative of my SPSS goto's, Tiffani Riggers-Piehl and Tal Oberto. It's not too often I get to be around people who like numbers as much as I do.

I would like to thank the great leaders I have had the privilege to work side-by-side with and who have made me into the leader I am today. Dick Comar – the courage to always ask why and the creativity to adjust what you do, to best fit the abilities of the team you lead. Keith Froelich – the perspective to lead with purpose and integrity. Scott McDowell – the skill and knowledge to utilize every resource and political will to meet the needs of all students. Michelle Fournier – the ability to connect to everyone and the compassion and heart to help each and every person. Justine Lang – the resolve and composure to persevere through the many challenges of leadership and life.

Finally, to my mom and dad, two lifelong educators, whose passion, unconditional love, and determination to help those in need, I see in myself every day. Thank you.

VITA

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CHAPTER ONE

Introduction

The Problem

The U.S. Department of Education published the landmark education report *A Nation at Risk: The Imperative for Educational Reform* in 1983. The report depicted the American education system as heading towards a "rising tide of mediocrity" and failing academically on most levels (National Commission on Excellence in Education [NCEE], 1983, p. 5). Since this report's impetus to improve public schools, there has been a significant amount of educational research dedicated to turning around low-achieving, high poverty schools. More than 300 K-12 in-depth studies were conducted on the attributes of high-achieving, low socioeconomic status (SES) schools from 1999 to 2005 (Center for Public Education, 2005a). Research has consistently shown a relationship between SES and academic achievement (Gottfried, Gottfried, Bathurst, Guerin, & Parramore, 2003). Notably missing from this body of research are higher SES schools. School reform policies for all schools are based on this body of research, even though current educational research continues to focus on how to improve underachieving, low SES schools. Yet, no correlation between research on academic achievement in low SES schools and academic achievement in higher SES schools has been concluded.

Struggling non-Title I schools embody a significant portion of the California education system. In 1999, the Public Schools Accountability Act (PSAA) was passed by the state of California to create a scoring system, called the Academic Performance Index (API) that ranks schools and districts. This legislation publicly rates and compares schools based on students' test results in the Standardized Testing and Reporting (STAR) program for grades 2 through 11 and the California High School Exit Exam (CAHSEE) for grades 10 through 12. In addition, the

federal government currently allocates $14 billion annually to low SES schools, better known as Title I schools, where at least 40% of students receive free and reduced lunch, to assist students near poverty and at risk of failure. Over a 12 year period (1999-2010), the average improvement in API score in non-Title I California high schools has been 14%, which is slightly more than 1% per year. This set of non-Title I high schools represent over 250,000 students. Furthermore, approximately 50,000 students attend non-Title I California high schools which have averaged less than 0.5% improvement in API score per year over 12 years (California Department of Education, 2010). This is a startling low level of academic achievement. A significant number of higher SES schools, where their SES already supports high levels of academic achievement, are improving academically at an alarmingly minimal rate. Yet, little to no research and resources has been allocated for their improvement.

Research Questions

This study will focus on the academic achievement in non-Title I high schools. The framework for determining academic achievement in non-Title I high schools is derived from multiple academic variables identified as indicators of success in high-achieving, low SES schools. The research questions for the study include:

1. What is the relationship between level of academic rigor and academic achievement in non-Title I high schools?
2. What is the relationship between student perceptions of school connectedness and academic achievement in non-Title I high schools?
3. What is the relationship between staff perception of school climate and academic achievement in non-Title I high schools?

Background of the Problem

Since the Coleman Report (1966) concluded that family demographics and socioeconomic status, not schools, had the greatest impact on student achievement, educational researchers have vigorously attempted to find and study effective schools in low poverty communities. In an attempt to disprove the Coleman Report, a group of researchers compiled common characteristics of high-achieving schools with low SES to formulate seven *Correlates of Effective Schools* – instructional leadership, clear and focused mission, safe and orderly environment, climate of high expectations, frequent monitoring of student progress, positive home-school relations, and opportunity to learn and student time on task – that would set in motion the effective school research movement of the 1980s (Brookover & Lezotte, 1979; Lezotte, 1991).

A Nation at Risk: The Imperative for Educational Reform (1983) further fueled the need for effective school research, especially in low SES schools. The findings indicated remedial courses were increasing at a rapid pace, reasoning and mathematic SAT (formerly the Scholastic Aptitude Test) scores had been dropping for nearly 20 years, and millions of adults were illiterate (NCEE, 1983). Secondary schools served up a "cafeteria style curriculum" where courses had been "homogenized, diluted, and diffused to the point that they no longer have a central purpose" (NCEE, 1983, p.18). Education historian and policy analyst Diane Ravitch (2008) labeled *A Nation at Risk* "the most important education reform document of the 20th century" (p. 1). The bleak outlook and blunt honesty of *A Nation at Risk* might have been the educational wakeup call the nation needed to fix underachieving schools.

One of the key commonalities found in the report *A Nation at Risk* and the effective schools research in the 1980s was the need to establish clear curriculum standards and high expectations for students and schools. Subsequently, the content standards movement emerged in the 1990s as a means to demonstrate accountability for these standards and expectations. States responded by adopting standards-based curriculum for all schools. Many states employed assessment and accountability systems to measure student progress in accomplishing these new content standards. As reforms were adopted, the research behind them was anchored by studies on high-achieving, low SES schools.

In 2001, with bi-partisan support, the U.S. congress passed the No Child Left Behind Act (NCLB). NLCB further increases accountability of schools to meet standards of high academic achievement, based on state-mandated standardized tests. NCLB is more prescriptive than *A Nation at Risk* in the pathways to improve student achievement. A key component of NCLB is to give options to students attending schools that do not meet the federal definition of success, the Adequate Yearly Progress (AYP). Schools that do not meet AYP goals two years in a row must provide students the opportunity to attend after-school programs, receive free tutoring, and transfer to local high-achieving schools. Pressure has continued to push researchers and school reformers to find methods of improvement for underachieving, low SES schools (EdSource, 2005), excluding underachieving, higher SES schools.

Purpose of the Study

We do not know if the same significant relationship between the academic variables present in Title I schools where improvement in student achievement has occurred exists with non-Title I schools. A substantive set of research studies on high-achieving, Title I schools has

identified several academic variables that improve academic achievement. The academic variables ascertained in high-achieving, Title I schools were used as a baseline for studying academic achievement in non-Title I schools. The purpose of this study is to establish a relationship, if any, between a set of these academic variables and student achievement in non-Title I high schools.

A culture of high expectations and rigor has been established not only for students, but for teachers as well. The belief that all students can learn is carried out by all staff. Curriculum is rigorous and consistent from classroom to classroom. Teachers provide proactive interventions and support for struggling students (Barth, Haycock, Jackson, Mora, Ruiz, Robinson, & Wilkins, 1999; Carlson, Shagle-Shah, & Ramiriz, 1999; Center for Public Education, 2005; Doherty & Abernathy, 1998; Kannapel & Clements, 2005; Reeves, 2003; Shannon & Bylsma, 2007; Visher, Emanuel, & Teitelbaum, 1999).

High-performing, low SES schools establish curriculum focused on student achievement. Curriculum is aligned with state standards and prepares students for college. Math and reading comprehension often receive extra emphasis. Success is determined not by what is taught, but rather by what is learned. Textbooks are viewed as a resource and not the order curriculum should necessarily be taught. Effective instruction is constantly measured (Carlson, Shagle-Shah, & Ramiriz, 1999; Center for Public Education, 2005; Corallo & McDonald, 2001; Doherty & Abernathy, 1998; George, Grisson, & Just, 1996; Kannapel & Clements, 2005; Reeves, 2003; Shannon & Bylsma, 2007).

School leaders demonstrate effective and instructional leadership. Leadership is often shared among all levels of staff. School leaders model best practices and high professional standards. Relationships between leaders and teachers are built on trust, transparency, and

shared values. Leaders are proactive in establishing and molding the school culture (Carlson, Shagle-Shah, & Ramiriz, 1999; Center for Public Education, 2005; Cotton, 2000; Doherty & Abernathy, 1998; George, Grisson, & Just, 1996; Johnson & Rose, 1999; Newmann & Wehlage, 1995).

Schools foster the protective factors of resiliency by creating an environment that includes caring and supportive relationships, norms and high expectations, and opportunities for meaningful participation (Benard, 1991). High expectations, caring and supportive relationships, and meaningful participation opportunities improve school connectedness by providing a support system for school, home, and the community. Resilience and self-protective characteristics can be improved and developed over time (Benard, 1991). Resiliency explains why some students from similar SES backgrounds succeed and others do not. Research indicates a strong association between resilience and academic achievement (Hanson & Austin, 2003; Reyes & Jason; 1993; Scales, Roehlkepartain, Neal, Kielsmeier, & Benson, 2006; Solberg et al., 1998; Toldson, 2008; Waxman & Huang, 1997).

There is a clear association between school climate and academic achievement (Freiberg, Driscoll, & Knights, 1999; Hoy & Hannum, 1997; Loukas & Robinson, 2004; Shindler, Jones, Taylor, & Cadenas, 2004). The impact of a positive school climate is multifaceted and far-reaching within schools. High expectations, caring relationships, meaningful participation, and a rigorous curriculum support a safe learning environment and positive school climate.

Researchers have continued to find consistent characteristics and common variables in underachieving Title I schools that have improved academically. However, little research has been conducted to determine if the variables found to improve Title I schools will also improve underachieving, non-Title I schools.

Significance of the Study

Although there is an existing body of abundant literature on academic improvement in Title I schools, the lack of research examining academic achievement in non-Title I schools remains. Hundreds of studies have been conducted on high-achieving Title I schools. Spanning K-12, the non-Title I California student population represents over a million students. During the 12-year time period California has used the API scoring system (1999-2010), the average change in API scores for non-Title I K-12 schools was a 14% increase. Over 900 of these schools improved less than 1% per year over the 12 years. Additionally, the 2010 API summary revealed that 48%, or 909 K-12 non-Title I schools, have API scores below the State benchmark for success – 800 points (CDE, 2010). These facts illustrate the need to obtain information on how to improve non-Title I schools. This study focused on academic variables that influence student achievement in non-Title I high schools.

Scope of the Study

A set of non-Title I high schools with a range of academic achievement were established to represent schools within quadrants 3 and 4 of the Academic Achievement – SES Model (Figure 1). The school selection criteria were based on the presence of data related to academic rigor, school connectedness, and school climate. Data that represents these three academic variables were selected from an analysis of past literature. The independent variable data set for schools will included Advanced Placement (AP) exams, SAT exams, University of California (UC) a-g course completion rates, California Healthy Kids Survey results, and California School Climate Survey results. The dependent variable for academic achievement was API score. A factor analysis and a correlation test were utilized to establish valid and representative scores for

academic rigor, school connectedness, and school climate. A regression analysis was then run between the independent variables and API score, while controlling for a set of student demographics, to determine what significant influence each variable had on student achievement.

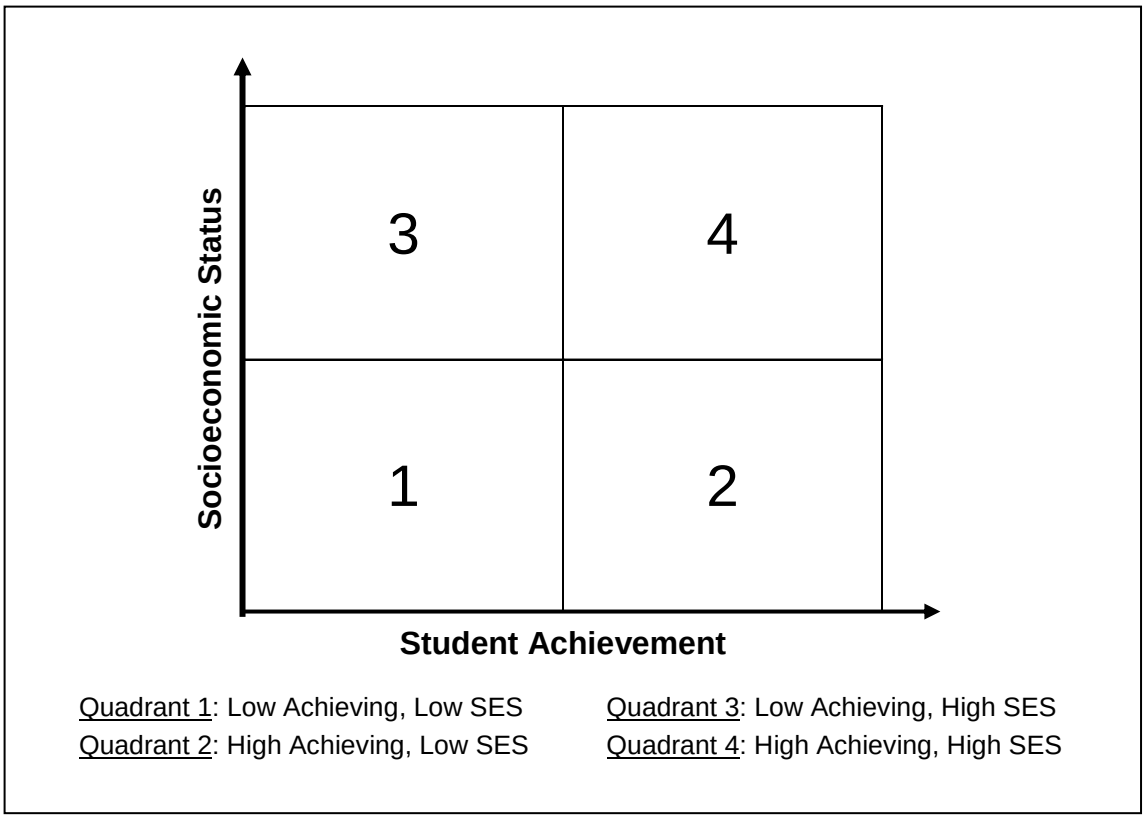


Figure 1. Academic Achievement-SES Model

Summary

Since the Coleman Report posited socioeconomic status was the greatest factor for student and school achievement, educators have pursued and searched for exceptions to this rule in order to keep hope for the American dream of fair and effort-driven opportunity for all. As a result, Title I schools that have beaten the odds despite dire conditions have been studied, compared, and modeled after. However, over the last 40 years support and research-based strategies for underachieving non-Title I schools have been far and few between.

This study focused on determining the relationships between three key academic variables – rigor, connectedness, and climate - which have been established in Title I schools, and academic achievement outcomes within non-Title I schools. The results give teachers, administrators, and leaders in non-Title I schools a set of research-based academic variables to help them determine strategies on how to best improve student learning within their own student demographic population.

With shrinking budgets, school districts and the administrators that run them need research-based school improvement strategies to maximize their funds. In addition, the increase in accountability for all schools shines a new spotlight on academic achievement in higher SES schools that have gotten by with mediocre effort in the past through the benefit of academically favorable student demographics, rather than through academic rigor and school culture. The findings of this study are also a starting point for qualitative research and case studies on non-Title I schools with significant and minimal academic improvement over an extended period of time. Academic research of non-Title I schools was long overdue.

CHAPTER TWO

Literature Review

Introduction

A large body of research has examined the elements of high performing, low SES schools in recent years (Center for Public Education, 2005). Rightfully so, considering that research has consistently shown a strong and reliable correlation between SES and academic achievement (Sirin, 2005). The US Department of Education agrees. Together, low SES schools receive over $14 billion from the US Department of Education (2011) under the Title I Elementary and Secondary Act that, in turn, comes with a system of accountability, including incentives and penalties for academic performance. Research has followed federal funds by studying Title I schools that were able to beat the odds. Policy makers then use this body of research to establish reform policies for all schools. However, no relationship between this research and improvement in non-Title I schools has been determined.

Non-Title I schools have little accountability and motivation to make research-based reforms in order to reach all of their students since SES is such a large determinant for academic achievement. The current NCLB accountability system is not intended to motivate non-Title I schools. The purpose of the NCLB Act was to eliminate the achievement gap between groups of students (US Department of Education, 2004). In order to close an achievement gap, the focus must be on improving the test scores of the largest, low performing group of students, in this case minority and low SES students, hence overlooking non-Title I schools. Compounding the problem of motivation to improve achievement for students in non-Title I schools is that nearly half of the high schools have already met or exceeded the state designated API benchmark score for success, 800 points. In California, nearly 25% of high schools are non-Title I, enrolling over

250,000 students (CDE, 2010). Although the federal funding policies and state benchmark for success suggest lack of impetus for non-Title I schools to academically improve, there is tremendous potential to improve academic performance if the relationship between student achievement and academic variables of success can be established. One of the most important conclusions from the research of Jean Anyon on how school knowledge is passed on to students from different social class schools is the lack of practical application learning in nearly all schools. Anyon (1981) asserts, "For those of us who are working to transform society, there is much to do, at all levels, in education."

The framework for this study is based on the influence three academic variables – rigor, connectedness, and climate – have on academic achievement. Recent studies have confirmed a relationship between these three variables and school achievement, mostly in Title I schools. Therefore, the general assumption would be that if the rigor, connectedness, and climate of a school increase, then the level of the academic achievement will increase.

In this literature review, the existing research relevant to this study is discussed and synthesized. In each section, a literature review on the established relationship between each of the independent variables and the dependent variable, academic achievement, will be discussed. The review begins by exploring the relationship between academic rigor and academic achievement. Next, the literature on how school connectedness and three external protective factors – high expectations, caring and supportive relationships, and opportunities for meaningful participation – within resiliency theory protect students from engaging in detrimental behavior and help them quickly and successfully recover from hardships, and as a result, improve academic achievement is examined. A discussion follows on school climate theory that establishes a set of factors that influence the school learning environment related to motivation,

engagement, safety, connectedness, attitudes, and behaviors. A large body of research suggests the importance of a positive school climate on a multitude of student and staff outcomes, in particular academic achievement. Finally, research that illustrates the relationship between socioeconomic status and academic achievement will be addressed.

Academic Rigor

With higher expectations comes more challenging and rigorous curriculum. The benefits of a rigorous curriculum are unmistakable. The quality and rigor of a high school curriculum are strong predictors of student success in college and work (Making a Difference in Communities, 2004). As this body of research has grown, many states have raised the number of challenging required course work necessary to graduate (Visher, Teitelbaum, & Emanuel, 1999). A number of studies have found a correlation between the number of math courses completed and achievement on standardized tests (Hoffer, Rasinski, & Moore, 1995; Rock & Pollack, 1995). A challenging curriculum has a positive effect on academic achievement (Barton, 2003).

Rigorous high school level courses have an impact on the ability of students to attain a college degree. Adelman (1999) found several factors associated with rigor and attaining a bachelor's degree after following a cohort of more than 10,000 students from 1980 to 1993. The findings indicated the completion of a college-prep academic core was more strongly correlated with a bachelor's degree than any other high school indicator of academic preparation. Also, students finishing a math course beyond Algebra II more than double their chance of earning a bachelor's degree. Students who completed more than one Advanced Placement (AP) course were the most likely to attain a bachelor's degree. Advanced Placement courses are used as a predictor of success for freshmen by college admissions offices (Hurwitz & Hurwitz, 2005).

More than 30 Advanced Placement courses and exams exist. According to the College Board's Annual AP Report to the Nation, the number of AP exams taken has more than doubled in the last decade. The strongest indicator that a student will attain a college degree is a rigorous high school curriculum (ACT, 2004). Research related to students who complete an AP course and exam versus students who do not, indicates that AP students are likely to take more advanced courses, choose challenging majors, and twice as likely to go on to advanced study (Camara, 2003). A challenging, rigorous curriculum motivates students by raising expectations.

Rigorous curriculum and higher level learning is used as a reliable predictor of college success by most colleges and universities, particularly first-year grade point average (GPA). Part of the application process for colleges is taking a standardized entrance or performance exam. The SAT is a strong predictor of first-year GPA for college students. In proving the validity and predictability of the SAT, a sample of 150,000 students and 110 colleges across the US were studied. The results indicated that the writing was the most predictive section of the SAT, slightly more than the math and critical reading sections (Kobrin, et al., 2008). SAT performance also predicts second-year retention of college students with 95.5% of high performers returning, but only 63.8% of low performers (Matter & Patterson, 2009).

The University of California utilizes a college entrance requirement made up of a sequence of high school courses that students must complete with a grade of "C" or better to be minimally eligible for admission to the University of California (UC) and California State University (CSU). This sequence of course taking is better known as the UC a-g course completion rate. The UC a-g completion rate is calculated by dividing the number of high school students who successfully completed the a-g subject areas requirements for University of California college prep curriculum with a grade of "C" or higher in a given year by the number

of freshmen four years earlier as reported by the schools. According to the online UC a-g Guide (2011), the UC faculty believes the subject area requirements demonstrate each student has effectively prepared for undergraduate work by learning a breadth of knowledge, critical thinking, and study skills that will support more advanced study. An initial study suggests a strong relationship between the academic experiences of students and the completion of UC a-g courses (Saunders, Silver, & Zarate, 2008). In this study, students who successfully completed algebra by the end of grade 9 graduated at higher rates of UC a-g course completion. Additionally, California Standards Tests (CST), which are meant to demonstrate student mastery of grade-level academic standards, were found to be predictive of UC a-g completion. Student outcomes on standardized exams can be an indicator of how well their high school coursework prepared them for college (Howell, Kurlaender, & Grodsky, 2010).

Academic rigor is demonstrated when students are continuously challenged to increase their previous level of knowledge and skills. Schools with minimal rigor often teach the same material repetitively without recognizing that students have mastered those skills, teach material students have already mastered, or teach content as material to be memorized rather than applied and analyzed in new situations. Schools that are too rigorous move on to more material before students have demonstrated mastery of the content and skills. A rigorous and relevant education takes place when standards, curriculum, instruction, and assessment interrelate and reinforce each other leading to an increase in students' enthusiasm to learn (Daggett, 2005). If students are enthused and engaged, the likelihood to improve academically should increase. The International Center for Leadership in Education developed a Rigor/Relevance Framework that theorizes students understand and retain knowledge best when they have applied it in a practical, relevant setting. Rigorous and relevant learning enables students not only to gain knowledge, but

also to develop skills such as inquiry, investigation, and experimentation. All students benefit because they will be challenged to achieve academic excellence, which ultimately boils down to applying rigorous knowledge to unpredictable, real-world situations, such as those that drive our rapidly changing world (Daggett, 2005).

School Connectedness

School connectedness occurs when students have a sense of belonging at school and perceive that teachers are fair and care about them. School connectedness is associated with caring relationships, high expectations for academic performance, and meaningful opportunities for learning, which foster a sense of connection to school (Benard, 1991). School connectedness reduces the negative impact of stressful situations and protects students from engaging in detrimental conduct. When students develop protective factors in an educational environment, the educational climate becomes optimal for fostering student resilience (Benard, 2004).

Resiliency in school creates a protection from risk and an ability to bounce back from hardships. Benard's (1991) WestEd publication, Fostering Resiliency in Kids: Protective Factors in the Family, School, and Community, is recognized with introducing the application of resiliency theory to the education field. According to Benard (1995), resiliency is a set of qualities that foster a process of successful adaptation and transformation despite risk and adversity. The protective factors necessary to cultivate resiliency mitigate negative factors, such as socioeconomic status, family instability, ethnicity, limited English language development, and low quality education. Students exhibit resiliency when protective factors are able to overshadow risk factors. Research suggests a strong connection between resilience and academic achievement (Hanson & Austin, 2003; Reyes & Jason; 1993; Scales, Roehlkepartain, Neal, Kielsmeier, & Benson, 2006; Solberg et al., 1998; Toldson, 2008; Waxman & Huang,

1997). Resiliency is a vital element in educational success and, more importantly, can be learned and nurtured. Resilience and self-protective characteristics can be improved and developed over time (Benard, 1991). Resiliency framework and theory explain why some students succeed and others do not from similar social and economic backgrounds. Schools foster the protective factors of resiliency by creating an environment that includes caring and supportive relationships, norms and high expectations, and opportunities for meaningful participation (Benard, 1991). High expectations, caring and supportive relationships, and opportunities for meaningful participation improves school connectedness by providing a support system for school, home, and the community.

High Expectations. Essential to high-achieving schools is a culture of high expectations. The belief that all students can learn is carried out by teachers and staff. Curriculum is rigorous and consistent from classroom to classroom (Barth et al., 1999; Carlson, Shagle-Shah, & Ramiriz, 1999; Center for Public Education, 2005; Doherty & Abernathy, 1998; Kannapel & Clements, 2005; Reeves, 2003; Shannon & Bylsma, 2007; Visher, Emanuel, & Teitelbaum, 1999).

Schools that express high expectations connect to students. High expectations convey to students they are worthwhile and have the ability to be successful. Student strengths and assets are emphasized rather than deficiencies. Teachers with high expectations express to students, "This work is important; I know you can do it; I won't give up on you." (Howard, 1990). Similarly, lack of expectations has a negative effect on students. When expectations are lowered for struggling students, those students are more likely to lose assurance in their ability to be successful (Battistich, Watson, Solomon, Lewis, & Schaps, 1999; Learning First Alliance, 2001; Wang, Haertel, & Walbert, 1997). Raising academic performance takes more than just

expecting high performance. Classrooms that exemplify high expectations demonstrate meaningful curriculum, clear rules and expectations, heterogeneous grouping, active participation and decision making, differentiated assessments, and constructive feedback (Anderman, 1997; Brooks, 2006). High expectations help motivate students to perform at higher levels and increase student achievement (Virginia Commonwealth, 2004; Picucci, Brownson, Kahlert, & Sobel, 2002). High expectations have consistently been linked to academic achievement and improved student behavior (Benard, 1996; Learning First Alliance, 2001; Visher, Teitelbaum, & Emanuel, 1999; Wang, Haertel, & Walbert, 1998).

Creating a culture of high expectations requires that students, as well as teachers and staff, believe in their ability to succeed and that they have the resources and support to accomplish this task. Teachers in schools recognize that significant barriers exist, but believe they are not insurmountable (Kannapel and Clements, 2005; Shannon & Bylsma, 2007). Teachers use test results to assess themselves as well as their students (Ragland, Clubine, Constable, Smith, 2002). Principals hold high expectations for staff, who hold high expectations for themselves and the students (Ragland, Clubine, Constable, & Smith, 2002; Kannapel and Clements, 2005). School staffs with high expectations take responsibility for student learning and refuse to give up and blame students and parents. They are willing to do whatever it takes to find a way to connect students to school and help facilitate learning.

Caring and Supportive Relationships. Dedicated staffs at high-performing schools cultivate caring and supportive relationships. Caring and supportive relationships convey compassion, understanding, respect, and safety (Gibbs, 1998; Kannapel and Clements, 2005). Trusting relationships provide a form of protection for students, teachers, and staff that helps build connectedness to each other and the school community (Benard, 1991; Pianta & Walsh,

1998). A strong link exists between caring relationships and academic success (Ryan & Patrict, 2001).

A caring and supportive environment is vital for students to make it through the ups and downs. Students face a multitude of challenges and adversity during their school experience. Schools facilitate caring educational environments by knowing student names, encouraging participation, intervening with students who are disconnected, listening, expressing mutual respect, providing opportunities to build relationships, and having high expectations (Brooks, 2006). Recognizing and rewarding students is also a big part of a caring environment. Support is expressed through incentive programs for academic improvement, acknowledging accomplishments, and rewarding positive behavior (Henderson & Milstein, 2003; Wang, Haertel, & Walberg, 1998).

With dropout rates around 50% and highly diverse student populations in most urban schools, the need for caring and nurturing environments are even more important for improving academic engagement and achievement. Most high schools, particularly urban ones, have several thousand students in attendance. Large schools feel impersonal, cold, and institutional. The Small Learning Community reform is based off the idea that all students should feel connected to school. Education reformers have realized the value of a caring environment as a fundamental necessity for student success (Henderson, 1997).

To educators, the idea that "when a student trusts you, they tend to work harder and go above and beyond for you," is common sense. When students feel connected with teachers they are more likely to be engaged, motivated, and higher achieving (Anderman, 1999; Murdock, Anderman, & Hodge, 2000; Ryan & Patrick, 2001). Improving student connectedness has even

shown to reduce risky behaviors (Benard, 2004; Klem & Connell, 2004; Steinberg & Allen, 2002).

The culture of a caring and supportive environment extends beyond the students and teachers. Caring and mutual relationships with families and schools are positively connected to academic achievement. Families that have respectful and supportive relationships, along with high expectations, have students that are academically successful (Cotton, 2001; Darling-Hammond, 1999; Henderson & Berla, 1994). Parental involvement in their child's education has been found to improve self-regulation in learning and behaviors (Connell & Halpern-Felsher, 1997). Strong parent-student relationships are related to higher student aspirations and academic achievement (Fan & Chen, 1999; Trusty & Harris, 1999). High-performing schools typically communicate well with parents. Teachers and staff view parents as critical partners at these schools (Ragland, Clubine, Constable, & Smith, 2002). A study of 350 high-performing, high poverty schools was conducted by the Educational Trust. The results illustrated that parents were being used as more than fund-raisers. Parents at these schools were encouraged to use their curricular knowledge and technical support to review student work (Barth et al., 1999). The association between student, school, and home relationships and academic achievement reinforces the notion that student learning and development is a shared responsibility.

Opportunities for Meaningful Participation. In order to foster caring and supportive relationships, schools have to trust and value students by giving them the responsibility to solve problems, develop goals, and make decisions. Students are consistent participants in meaningful opportunities in high-achieving schools (Wang, Haertel, Walberg, 1997). Abundant opportunities for students to contribute and participate in engaging and valuable ways are a common characteristic of schools that develop resiliency (Benard, 2001; Zimmerman &

Arunkumar, 1994). Crucial to creating these types of opportunities is the belief by teachers and staff that students are valuable resources, rather than static vacuums of information. Research has demonstrated an association between opportunities for meaningful participation at school and an increase in academic performance (Benard, 2004).

Responsibility is developed from opportunities to contribute, solve problems, and make decisions in meaningful situations. Cooperative learning strategies promote active learning by students with their peers, thus increasing engagement and connectedness (Learning First Alliance, 2001; Wang, Haertel, & Walberg, 1998). Cooperative learning environments are effective with low-achieving and high-achieving students (Slavin, 1996). Schools can facilitate further opportunities by allowing students to participate in classroom, governance and service learning projects (Brooks, 2006). Participation in before- and after-school programs, sports teams, school clubs, and other extracurricular activities give students a sense of belonging to a community. Participation in relevant and interesting activities within school and the community helps students develop autonomy and independence that is necessary for students to feel they can contribute and are capable. This sense of autonomy builds resilience and improves learning (Benard, 1991; Chirkov & Ryan, 2001). Schools that provide meaningful opportunities to participation show they care, believe in, and have high expectations for their students, which further builds school connectedness for students.

School Climate

High expectations, caring relationships, meaningful participation, and a rigorous curriculum support a safe and positive learning environment and school climate. The impact of a positive school climate is multifaceted and far-reaching within schools. The connection between

school climate and academic achievement has been well-documented (Freiberg, Driscoll, & Knights, 1999; Hoy & Hannum, 1997; Loukas & Robinson, 2004; Shindler, Jones, Taylor, & Cadenas, 2004).

Researchers do not have a commonly accepted definition of school climate. For the purposes of this study, the definition put forward by the National School Climate Council will be used. The National School Climate Council (2007) defines school climate as a "pattern of people's experiences of school life and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures." Even without an established definition for school climate, the majority of scholars suggest that school climate essentially reflects a subjective experience in school (Cohen, 2006). The list of dimensions that shape a school climate is extensive and inconsistent. However, most research suggests positive school climates promote four areas of focus: safe learning environment, relationships, norms and standards, and academic achievement (Center for Social and Emotional Education, 2010).

Climate can be thought of as external assets (things outside of students that predict, or promote connectedness), whereas connectedness can be thought of as internal assets (students' feelings, perceptions, and beliefs). School climate is related to school connectedness, because without a positive and welcoming school climate, students cannot experience connectedness. School climate research emerged from organizational climate research and school effects research, having inherited research methods, theory, and instruments from both research models (Anderson, 1982). An early definition of school climate was characterized as "the atmosphere or ambience of an organization as perceived by its members" (Ehman, 1980). Marshall (2004), a researcher with the Center for Research on School Safety, School Climate and Classroom Management, identified six common factors that shape school climate: (1) number and quality of

interactions between adults and students, (2) students' and teachers' perception of their school environment, or the school's personality, (3) environmental factors, (4) academic performance, (5) feelings of safeness and school size, and (6) feelings of trust and respect for students and teachers. The National School Climate Center, an organization that helps schools incorporate social and emotional learning, suggests there ten essential dimensions that establish school climate: environmental, structural, safety, teaching and learning, relationships, sense of school community, morale, peer norms, school-home-community partnerships, and learning community. The overlap and differences in the school climate shaping dimensions is a result of the difficulty in establishing the intangible qualities that make up a school climate.

The impact of school climate has been associated with a diverse and extensive set of student and staff outcomes. School climate has demonstrated an association with safety and well-being, including student self-esteem (Hoge, Smit, & Hanson, 1990), effective risk prevention (Berkowitz & Bier, 2005; Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2002; Greenberg et al., 2003), reduced violence (Brookmeyer, Fanti, & Henrich, 2006; Goldstein, Young, & Boyd, 2008; Karcher, 2002), reduced bullying behavior (Birkett, Espelage, & Koenig, 2009; Kosciw & Elizabeth, 2006; Meyer-Adams & Connor, 2008; Yoneyama & Rigby, 2006) decreased absenteeism (DeJung & Duckworth, 1986; Gottfredson & Gottfredson, 1989; Rumberger, 1987), and fewer discipline referrals and school suspensions (Nelson, Martella, & Marchand-Martella, 2002; Welch, 2000; Wu, Pink, Crain, & Moles, 1982). Evidence for the impact of school climate with staff has been connected to decreased teacher burnout (Grayson & Alvarez, 2008), higher levels of job satisfaction (Lee, Dedrick, & Smith, 1991; Taylor & Tashakkori, 1995), and increased job retention (Guarino, Santibanez, & Daley, 2006; Kelly, 2004; Loeb, Darling-Hammond, & Luczak, 2005). Simply put, school climate influences how

educators feel about being in school and how they teach (Cohen & Geier, 2010). This large and growing amount of evidence helped build the foundation of the Safe and Drug-Free school and Communities Act. This piece of legislation was part of the federally created *No Child Left Behind Act* (2001) which attempts to "foster a safe and drug-free learning environment that supports student academic achievement" (United States Department of Education, 2004). The U.S. Department of Education recognizes the importance of a positive and safe learning environment. School climate research implies that positive relationships and meaningful learning opportunities for students in all demographic environments can increase achievement levels (McEvoy & Welker, 2000).

Research supports the theory that school climate is directly related to academic achievement (Brand, Felner, Shim, Seitsinger, & Dumas, 2003; Brookover, Beady, Flood, Schweitzer, & Wisenbaker, 1977; Brookover, 1978; Brookover & Lezotte, 1979; Fleming et al., 2005; Freiberg, 1999; Good & Weinstein, 1986; Gottfredson & Gottfredson, 1989; Griffith, 1995; Ma & Klinger, 2000; MacNeil, Prater, & Busch, 2009; Madaus, Airasian, & Kellaghan, 1980; Rutter, 1983; Rutter, Maughan, Mortimore, & Ouston, 1979; Shipman, 1981; Stewart, 2008). Students who feel safe at school are more likely to have higher grade point averages and plan to go to college (Clarke & Russell, 2009). In fact, the quality of school climate appears to be the most predictive factor in any school's ability to support academic achievement (Shindler, 2009). The effects of a positive school climate have also been show to persist for many years later (Hoy, Hannum, & Tschannen-Moran, 1998).

Research has concluded, in general, that positive school climates produce positive educational and psychological outcomes for students and staff; likewise, a negative school climate can prevent optimal learning and development (Freiberg, 1999; Johnson & Johnson,

1997; Kuperminc, Leadbeater & Blatt, 2001; Kuperminic, Leadbeater, Emmons, & Blatt, 1997; Manning & Saddlemire, 1996). School climate refers to factors that contribute to the atmosphere and attitudes toward a school. A multitude of research-based interventions and reforms have been implemented to help schools improve academic achievement, but if the basic structure of a school is dysfunctional, its capacity to promote its desired goals is limited (Fullan, 2003). A positive school climate is associated with feeling safe at school, well-managed classrooms, high expectations concerning individual responsibility, and teachers that consistently acknowledge all students and fairly address their behavior. Successful teaching and learning cannot occur unless basic environmental supports and opportunities are present to create a positive school climate that meets the developmental needs of students and teachers (National Research Council and the Institute of Medicine, 2004). An effective school learning environment promotes positive behavioral health for all students. A positive and supportive school climate improves student performance.

Socioeconomic Status

Despite the determination of schools to foster connectedness, resiliency, academic rigor, and a positive school climate, SES is still a more significant factor for academic achievement. SES is one of the most widely used background factors to predict individual differences in academic achievement (Sirin, 2005). A large body of research has demonstrated a strong association between SES and academic achievement (Baydar, Brooks-Gunn, & Furstenberg, 1993; Bradley & Corwyn, 2002; Gottfried, Gottfried, Bathurst, Guerin, & Parramore, 2003; Liaw & Brooks-Gunn, 1994; Shakiba-Nejad & Yellin, 1981). Research suggests that low SES students, found to be academically capable, are less likely than high SES students to attend

colleges and universities directly after high school (Plank & Jordan, 2000). The National Center for Education Statistics (NCES) reports that only 7% of low SES students obtain a bachelor's degree within the first eight years after graduating from high school; in contrast to 24% of middle SES and 60% of high SES students (US Department of Education, 2003). The significance of the relationship between SES and academic achievement is illustrated by the continued funding allocated by the federal government for Title I schools. The US government allocates $14 billion annually to low SES, or Title I, schools where at least 40% of students receive free and reduced lunch to assist students near poverty and at risk of failure. For this study, low SES schools will be defined as schools receiving Title I funds and higher SES schools as those who do not receive Title I funds.

The challenge with using SES as a construct is the influence of other variables. A particular difficulty in examining the relationship between SES and academic achievement is the extent to which race is confounded with SES when predicting child outcomes (McLoyd, 1998; Pungello, Iruka, Dotterer, Mills-Koonce, & Reznick, 2009). In addition, SES may indirectly influence academic achievement. This creates a challenge when identifying and examining the effects of other variables with academic achievement.

Summary

With $14 billion allocated to Title I schools each year by the federal government, a large body of research has found a multitude of variables, that when present, have helped to improve underachieving Title I schools. This study will analyze the relationship the following three variables have with academic achievement, which has been suggested in low SES schools: 1) academic rigor, 2) school connectedness, and 3) school climate. An environment that supports a

rigorous curriculum also has a positive effect on academic achievement. The sense of belonging and connectedness to school fosters resilience in students. The protective factors of resiliency can be developed within an environment that has caring relationships, high expectations, and opportunities for meaningful participation. Lastly, the school climate impact on educators affects their attitude towards school and how they teach, which has a lasting effect on how student learning and achievement. However, the following question still remains: Do academic rigor, school connectedness, and school climate have the same influence academically in non-Title I schools as they have demonstrated in successful Title I schools?

CHAPTER THREE

Methodology

Introduction

The purpose of this study was to examine the relationship between academic achievement and three academic variables: rigor, school connectedness, and school climate. This study specifically targeted non-Title I high schools. Research on these variables extended previous research to a new and different set of schools. The review of literature found several variables that influence academic success. Although a substantial body of research exists on the influence of a multitude of variables on academic achievement, minimal research targets high schools which are not low SES or do not receive federal Title I funding. An initial analysis from 2010 school achievement data, API scores, confirmed that nearly 45% of non-Title I high schools failed to improve 1% per year over the 12-year time period from 1999-2010. Furthermore, 10% of the non-Title I high schools failed to improve academically even 0.5% per year over the same time period (CDE, 2010).

The goal of this non-experimental quantitative secondary data analysis was to examine relationship between academic achievement and academic rigor, school connectedness, and school climate in non-Title I high schools. A clear understanding of the relationships, or lack thereof, with academic achievement can provide targeted and specific research-based strategies to direct non-Title I high schools in their quest to improve student learning. In this chapter the research design and procedures used to answer the research questions will be described. A summary of the site selection, data collection procedures, data analyses, and ethical considerations was also included.

Research Questions

The study sought to address the following research questions:

1. What is the relationship between level of academic rigor and academic achievement in non-Title I high schools?
2. What is the relationship between student perceptions of school connectedness and academic achievement in non-Title I high schools?
3. What is the relationship between staff perception of school climate and academic achievement in non-Title I high schools?

Research Design

The research design for this study was non-experimental quantitative secondary data analysis. Quantitative research is a type of educational research in which specific questions are asked, numerical data are collected from participants, analyzed using statistics, and conducted objectively without bias (Creswell, 2007). Quantitative research reports provide an unbiased narrative analysis of the statistical calculations performed during the study (Creswell, 2007). Non-experimental research is a category of quantitative research that attempts to describe associations between variables (Cottrell, Girvan, & McKenzie, 2005). In non-experimental research, the sample is not random and there are not test and control groups. For this study, a specific set of schools was selected based on the SES of the students. This study analyzed the statistical relationships between the independent variables, three academic variables, and the dependent variable, academic achievement utilizing secondary data. This association had been previously tested on a different population sample, low SES schools, to determine the impact on improving academic achievement. Past research indicated a positive relationship between

academic rigor, school climate, and school connectedness, and academic achievement in low SES schools. A positive relationship would suggest that when academic rigor, school connectedness, or school climate are high, academic achievement will be high as well. Once the relationship is determined between this set of variables and academic achievement for non-Title I schools, further detailed, in-depth case studies and qualitative research can then be conducted.

A correlational design was utilized to establish the relationship between the predictors, or independent variables, which include school connectedness, school climate, and academic rigor, and the outcome, or dependent variable, academic achievement. This is an appropriate design in correlational statistics when discovering relationships between variables (Creswell, 2005; Gall, Gall, & Borg, 2007; Sowell & Casey, 1982). Variables are not manipulated within correlational and non-experimental research, but measures of association are used to study their link, or lack thereof (Vogt, 2005). Correlational research assists in determining the strength and direction of the association between two or more variables (Sowell & Casey, 1982; Warner, 2008). Correlational research does not verify the cause-and-effect relationships, but instead clarifies the connection between variables by identifying relationships among variables (Fraenkel & Wallen, 2009).

The population variables were examined through a statistical cross-sectional design to collect secondary data representing academic rigor, school connectedness, and school climate from multiple high schools at the same time. Academic rigor was expected to be measured by the Advanced Placement (AP) and Scholastic Aptitude Test (SAT) proficiency percent and percent of students tested, and by University of California (UC) a-g subject area course completion rate for the sample population. School connectedness was measured by a set of survey questions administered to grade 9 and 11 students every two years at school sites through

the California Healthy Kids Survey (CHKS). School climate was measured by a set of survey questions administered every two years to teachers at school sites through the California School Climate Survey (CSCS).

The research was conducted in four main stages. During the first stage, schools sites were selected that met the predetermined criteria. In stage two, school data were collected from multiple databases. Stage three consisted of combining the six separate databases into one data file that was transferred into a data analysis computer software program. In the final stage, a statistical analysis was conducted to determine the relationship between the independent and dependent variables when controlling for a set of student demographics.

Site Selection

This study focused on non-Title I high schools. Using the California Department of Education data files from 2010 for public schools, there were 9,836 K-12 schools listed in California. The schools were then narrowed down to a set of 1,909 non-Title I schools, which have less than 40 percent of their students with free or reduced lunch. After all primary, or K-8, schools were removed, a set of 776 non-Title I high schools remained. Next, any schools with less than 100 valid CST scores or any incomplete data in any of the six academic related variables were eliminated, leaving 499 schools. The three filters of criteria reduced the sample population of non-Title I high schools to 263.

Data Sources

The review of literature suggested multiple databases measured for academic rigor, school connectedness, school climate, and academic achievement. The secondary data utilized

for this study was merged from four databases, the California Department of Education Postsecondary Preparation data files, California Post-Secondary Education Commission database, WestEd California Healthy Kids Survey, and WestEd California School Climate Survey. The CDE Postsecondary Preparations data file contained measures for the following variables: AP (rigor), SAT (rigor), ethnicity (demographics), parent education level (demographics), English learners (demographics), and API scores (dependent variable). The California Post-Secondary Education Commision data file contained a measure the UC a-g course completion rate (rigor). The WestEd California Healthy Kids Survey contained data measures for School Connectedness. The WestEd California School Climate Survey contained data measures for School Climate. The school measures for academic rigor (AP, SAT, UC a-g data), academic achievement (API scores), and school demographics (ethnicity, parent education, English learner) were publicly released databases through the CDE website. The school level measures for school connectedness (California Healthy Kids Survey) and school climate (California School Climate Survey) were confidential and held by WestEd, a non-profit, public research and development educational agency. An MOU, including a Confidentiality Agreement, was obtained.

The academic achievement and demographics measures were attained from the California Department of Education API Data Files, which were located within the Testing and Accountability section of the California Department of Education website. This database contains over 150 data fields that were converted into a Microsoft Excel file when downloaded. The student demographics of the student population used in this study were Asian, Black or African American, English Learners, Hispanic or Latino, and Parent Education Level. The California Basic Educational Data System, otherwise known as CBEDS, is a system for

collecting and sharing demographic data about students, schools, school districts, and classified staff in the California public school system in kindergarten through grade twelve. The data are collected annually in October. CBEDS data are reported through an Online Reporting Application called CBEDS-ORA. Data are collected at the individual student level using Statewide Student Identifiers (SSIDs). These data are aggregated up to the school level and then combined with data collected through CBEDS for reporting purposes. The API scores are a numeric index (or scale) that ranges from a low of 200 to a high of 1,000. A school's score or placement on the API is an indicator of the school's performance level. The statewide API performance target for all schools is 800 (CDE, 2010).

The AP and SAT exam measures for academic rigor were attained from the Postsecondary Preparation data files within the Data and Statistics section of the California Department of Education website. The AP and SAT test programs are administered by the College Board, a non-profit organization in the United States. Advanced Placement (AP) is a set of high school classes with curriculum designed to be at the college level. An AP class is designed to prepare a student to take an AP test at the end of the year. The SAT test is designed to measure a student's ability to understand and process elements in three subjects: reading, writing, and math. The SAT Reasoning Test is a standardized test that assesses the critical reading, mathematics, and writing skills that students need to be successful in college. Each of the three sections that comprise the SAT Reasoning Test has a possible score of 800 points (CDE, 2010).

The UC a-g completion rate for each school was obtained from the California Postsecondary Education Commission website database search engine. The data were categorized by school code number and was therefore entered individually into an Excel

spreadsheet by school. Each California high school is given a University of California (UC) a-g completion rate based on the percent of senior students that meet the minimal UC a-g Subject Requirements in approved high school courses. In UC a-g courses, students must receive a grade of "C" or higher to validate course completion (University of California, 2011).

Databases utilized to represent school connectedness and school climate were obtained from WestEd. Local Education Agencies (LEA), or school districts, are required to administer the CHKS and CSCS simultaneously at least once every two years in compliance with Title IV requirements of the No Child Left Behind Act with students in grades 5, 7, 9, and 11. The CHKS and CSCS both use Likert scales to collect information from participants. The survey questions or statements consisted of the following two possible responses: *strongly disagree, disagree, neither disagree nor agree, agree,* or *strongly agree; not true at all, a little true, pretty much true,* or *very much true.* Student perceptions for school connectedness are comprised of 32 questions within four sections of the CHKS: caring relationships, high expectations, meaningful participation, and school connectedness. These three developmental supports, or protective factors, align with the effective school characteristics (National Research Council, 2004). School staff administered the survey following detailed instructions provided by CDE designed to assure the protection of all student and parental rights to privacy and maintain confidentiality. Students were surveyed only with the consent of parents or guardians. Each student's participation was voluntary, anonymous, and confidential. Several measures and procedures have been implemented in the CHKS to further ensure that data are reasonable estimates of behavior for all students. Student responses that might not be valid because they did not take the survey seriously, were careless, or did not answer truthfully, are removed. When the CHKS data are processed, each participant's responses are examined for reliability (e.g., 30-day substance

use should not be more frequent than lifetime use) and validity (e.g., reporting exaggerated substance use, such as daily for alcohol/marijuana/cocaine; WestEd, Jerry Bailey, personal communication, May 11, 2008). In all, there were seven response checks—students who did not pass three or more of these checks were considered to have provided implausible responses and were not included in this study (WestEd, 2011a). Staff perceptions of school climate are comprised of 42 questions within five domains of the CSCS: safe learning environments, norms and standards that encourage academic success, positive staff-student and intra-staff relationships, student behaviors and conditions that facilitate learning, and services and programs that address student nonacademic barriers to learning. The CSCS data can be further disaggregated into ten educational domains that provide data on learning barriers, engagement, and supports. Although the CSCS is available to all staff, those who do not wish to participate are not required to do so. The survey must be completed online in one session. At the end of that session, results are submitted electronically to WestEd and can be viewed online. The survey is anonymous and all results are confidential. Background information is collected to enable districts and the state to determine how representative the respondents were of the general population and to enable analyses of the results by subgroups. However, to preserve confidentiality, no information is provided that is derived from any subgroups of less than five respondents (WestEd, 2011b).

Data Analysis Methods

Once obtained, the multiple Excel databases were combined into one set of variables within SPSS, computer software used for statistical analysis (Pallant, 2007). The data for this study were on an interval scale since numbers representing the variables are ranked in

accordance to the assigned characteristic or ratio scale for data rates. The intervals between the ranking numbers were equal in size and arbitrarily assigned. Rates have the same properties as an interval, but a clear value for zero exists (Agresti & Finley, 2009).

Correlations were generated with the independent variables, academic rigor, school connectedness, and school climate, and the dependent variable, academic achievement. The correlational approach describes the linear relationship between the independent variables and the dependent variable. Correlational statistical analysis determines the statistical significance between the variables (Creswell, 2005). The significance levels most commonly used in educational research are the .05 and .01 levels (Fraenkel & Wallen). Significance level refers to the probability of an event not occurring by chance. A significance level, or critical p-value, of .05 was used for all statistical tests in this research study. A significance level of .01 is more commonly used in studies with large samples.

A correlation coefficient creates a value that represents the association between the variables on a scale. Correlation coefficients range from -1.00 to +1.00 (Agresti & Finley, 2009). The most commonly used correlation coefficient used to describe linear relationships is the Pearson *r*. The Pearson *r* measures the magnitude and direction of the correlation between variables. In other words, the Pearson *r* establishes the degree to which two variables are proportional to each other. The line representing the linear and proportional relationship is correlation.

A multiple regression analysis was utilized to learn more about the relationship between the independent and dependent variables. A multiple regression analysis helps understand how the value of the dependent variable changes when any one of the independent variables is entered, while controlling for one or more extraneous variables (Agresti & Finley, 2009). A

simultaneous method of variable entry was utilized for the multiple regression model. Within the SPSS statistical software, the simultaneous method of variable entry is called the "Enter" method. This is an appropriate method of analysis when studying a small set of predictors and when previous research suggests which variables will create the best predication equation (Agresti & Finley, 2009). Each predictor is assessed as though it were entered after all the other independent variables were entered, and assessed by what it offers to the prediction of the dependent variable that is different from the predictions offered by the other variables entered into the model. Additionally, the independent variables were entered in two blocks or variable models. A block entry method was utilized to control for student demographics, which have a robust amount of evidence suggesting them to be the most significant variables for predicting academic achievement. The first block contained the following school demographics for students: percent Asian, percent Hispanic or Latino, percent Black or African American, percent English Learners, and average parent education level. The second block for the regression included the five student demographic variables and the following six academic related independent variables: percent exam takers, percent proficient scores, UC a-g completion rate, school connectedness, school relationships, and student learning environment.

Ethical Issues

The study analyzed a set of non-Title I high schools. No specific student data were attained for this study. All school level data were labeled with a school code rather than by name. Maintaining confidentiality of potentially harmful and sensitive information was essential. Schools were described only in characteristics, not by name. No human subjects were utilized in this study to ascertain data.

Reliability and Validity

Reliability and validity are dependent on the research assumptions, the collection and analysis methods, and the interpretation of the findings. Without these precautions, the research may be for naught if findings are not trustworthy.

The CHKS and CSCS both use Likert scales to collect information from participants. Consistent measurements in quantitative surveys are provided with Likert-scale responses which can be analyzed using a data analysis tool, such as SPSS (Creswell, 2005). Data for the CHKS and CSCS were collected through self-report measures, and therefore social pressure or inaccurate self-perceptions could have influence the participants' responses. To address this threat, the final survey results only included participants that passed multiple reliability and validity checks performed by WestEd, which is the non-profit, public research and development agency who conducts the CHKS and CSCS for the California Department of Education. In addition, the remaining data measures were annual test results, demographics, or school ranking scores that present valid and accurate school level information. The sample size of 263 schools also provided a large enough database of school information to reliably generalize the findings so that schools with similar demographics can potentially use the information.

The relationship between three variables – academic rigor, school connectedness, and school climate – and academic achievement was examined. The three variables may not have actually measure what they are intended to measure. This is an intent to measure threat. There were multiple questions attempting to answer each variable, giving the measurement more validity. The academic rigor variable was measured by three sets of student outcomes that did not directly test rigor, but rather student academic knowledge and course completion. An

operationalized metric was developed through a factor analysis and linked to conceptual framework for the concept of academic rigor in order to be measured and analyzed numerically.

The CHKS and CSCS surveys were conducted once every other year for students in grades 9 and 11. Without taking multiple applications of the survey throughout the school year, it cannot be determined if the responses had seasonality, especially with school connectedness items. This is a survey timing threat (Creswell, 2003). The opinions of students could have been different at the beginning of the school year when the environment is less tense, classes have minimal grades, and friends are returning from not seeing each other for an extended period of time rather than at the end of the school year when summer break is close and subject finals are occurring. Conversely, students may feel less connected to teachers at the beginning of the school year than later in the year after their teachers have had a chance to give them extra support.

Some participants may have given socially acceptable survey responses, falsified the truth to make themselves look better, or had mistaken memories, creating a participant bias (Creswell, 2003). WestEd meets the anonymity criterion, as well as other validity criteria such as alternate forms of questions and cross-checks to determine how truthful each respondent has been.

A confounding threat can cause overestimation or underestimation of the true association (Creswell, 2003). Once part or all of a significant relationship between variables is established, an error in interpretation can be made through being casually associated with a third variable. There are many variables as potential determinants for academic success. Confounding threats can be controlled through a multiple regression analysis. A multiple regression analysis was used

in this study. A multiple regression analysis simultaneously observes and analyzes more than one statistical variable.

Summary

The study used a quantitative research methodology to analyze the association between variables collected from multiple databases. There was a multi-stage process utilized to select a specific set of schools that met predetermined criteria. After the set of schools was determined, independent and dependent variable data were collected for each school and combined into one common database. This database was transferred to SPSS statistics computer software and checked for correlations. The results can be shared with school teachers, administrators, and organizations to further improve the ability of non-Title I schools and districts to be make budget-conscious, research-based decisions that will improve student learning.

CHAPTER FOUR

Findings

Introduction

This study was designed to examine whether relationships exist between a set of academic variables and academic achievement in non-Title I high schools. To do so, a multiple regression was utilized to determine the nature of potential relationships between school API scores and academic rigor, school connectedness, and school climate. The secondary data utilized for this study was merged from four databases, the California Department of Education Postsecondary Preparation data files, California Post-Secondary Education Commission database, WestEd California Healthy Kids Survey, and WestEd California School Climate Survey. The following research questions were developed to determine the extent of the relationships:

1. What is the relationship between level of academic rigor and academic achievement in non-Title I high schools?
2. What is the relationship between student perceptions of school connectedness and academic achievement in non-Title I high schools?
3. What is the relationship between staff perception of school climate and academic achievement in non-Title I high schools?

A regression model that allowed for the predictor variables to be entered simultaneously was conducted. No theoretical model exists indicating that academic rigor, school connectedness, or school climate has a more significant impact on academic achievement than another variable. When there is no reason to believe one variable is likely to be more important than another, a simultaneous method should be used (Agresti & Finley, 2009).

The findings are presented in five sections. The first three sections are organized by research question and dedicated to presenting the factor analysis results utilized to determine which academic factors best represent academic rigor, school connectedness, and school climate. The descriptive statistics of the sample are presented next. The last section addressed the research questions through the results of the correlational findings between academic achievement and academic rigor, school connectedness, and school climate.

Academic Rigor

The literature pointed towards three potential sets of data that could represent academic rigor for schools: AP exams, SAT tests, and UC a-g course completion rates (Barton, 2003; Korbin, et al., 2008; Freedman, Friedmann, Poter, and Schuessler, 2011). Within these data sets, there were five expected academic rigor variables: percent AP exam takers, AP exam proficiency percent, percent SAT exam takers, SAT proficiency percent, and UC a-g course completion rate (Table 1). The AP exam scores range from 1 to 5. The SAT exam scores range from 600 to 2400. A score of 3 or higher on the AP exam and 1500 or higher on the SAT test are the accepted education benchmarks for success on those exams. The AP exam proficiency percent was calculated by creating a ratio between the number of AP exam scores of 3 or higher and the total number of AP exam taken. The SAT pass percent was calculated by creating a ratio between the number of SAT exam scores of 1500 or higher and the total number of SAT exam taken. The California Department of Education (CDE) calculated the percent of AP exam takers by comparing the number AP exam takers and the total grade 11 and 12 students. The CDE determines the percent of SAT exam takers using the number of SAT test takers and number of grade 12 students. The UC a-g completion rate is calculated by dividing the number of high

school students who successfully completed the a-g subject areas requirements for University of California college prep curriculum with a grade "C" or higher in a given year by the number of freshmen four years earlier as reported by the schools.

Table 1

Rotated Component Matrix for Academic Rigor Variables

Variable	*Factor 1*	*Factor 2*
UC a-g Course Completion Rate		
Percent of AP Exam Takers		0.859
Percent of SAT Exam Takers		0.894
AP Proficiency Percent	0.916	
SAT Proficiency Percent	0.930	

Construct validity was assessed by performing a factor analysis on the academic rigor items, as noted in Table 1. Construct validity is the extent to which a test measures the concept or construct that it is intended to measure. The main applications for a factor analysis are to classify and reduce the number of variables (Agresti & Finley, 2009). In a factor analysis, correlations called factor loadings are conducted between the variables. Factor loadings of 0.5 or greater are significant items (Hair et al., 1998). The factor analysis for academic rigor contracted the number of academic rigor variables from the expected five to three by extracting two new factor components. The first extracted factor from the factor analysis converged the AP proficiency percent, 0.916 factor loading, and the SAT proficiency percent, 0.930 factor loading. This new factor was labeled *Percent Proficient Scores*. The second extracted factor converged the percent of AP exam takers, 0.859 factor loading, and percent of SAT test takers, 0.894 factor loading. The second new factor was labeled *Percent Exam Takers*. The UC a-g completion rate

for graduates did not load onto either factor. Since the two new academic rigor factors or variables, percent proficient scores and percent exam takers, were made up of two items each, a scale score was computed using the unweighted average of the two items.

After the factor analysis, the reliability of the resulting factors was assessed by calculating the Cronbach's alpha of each factor (Table 2). Cronbach's alpha is a coefficient that measures the internal consistency or correlation of the items by measuring the homogeneity of a group of items. Values closer to one indicate a higher level of internal consistency. If correlations between items are too low, it is likely that they are measuring different variables and therefore should not all be included in a test that is supposed to measure one variable. If item correlations are too high, it is likely that some items are redundant and should be removed from the variable. The acceptable range for Cronbach's alpha is 0.70 to 0.90 (Hair et al., 1998). As noted in Table 3, the results for each factor fell within this range. Thus, for the purposes of this study, academic rigor was represented by three variables: percent exam takers, percent proficient scores, and UC a-g completion rate.

Table 2

Reliability Statistics for Academic Rigor Factors

Factor	*Cronbach's Alpha*
Percent Exam Takers	0.834
Percent Proficient Scores	0.880

School Connectedness

The California Healthy Kids Survey (CHKS) was utilized to measure school connectedness for this study. The CHKS was developed by the California Department of

Education (CDE) to measure student risk and resiliency. The CHKS is administered to grade 9 and 11 high school students every two years. Subscales were created within the CHKS to measure how much students feel valued, treated fairly, and a part of school, including the School Connectedness Scale and School Environment Scale (Libbey, 2004).

The School Connectedness Scale is made up of five question responses related to how much students feel like they are safe and belong. Students are asked to respond to the five items after reading a prompt. The five items for this scale are the following: "*How strongly do you agree or disagree within the following statements about your school…I feel close to people at this school; I am happy to be at this school; I feel like am part of this school; the teachers at this school treat students fairly;* and *I feel safe in my school*." The response scale is 1 *strongly disagree*, 2 *disagree*, 3 *neither disagree nor agree*, 4 *agree*, and 5 *strongly agree*. The CHKS data set had a computed School Connectedness score, which was the average score for all five questions.

The School Environment Scale is a subscale from CHKS's Resilience Youth Development Module (RYDM). The RYDM was developed to measure external protective factors: caring relationships, high expectations, and meaningful participation. When these three factors are present, an environment is created that purposefully connects students to school and builds resiliency (Benard, 2004). These three factors are measured through nine survey questions. The items for this scale are the following: "*At my school, there is a teacher or some other adult who... really cares about me; tells me when I do a good job; notices when I'm not there; always wants me to do my best; listens to me when I have something to say; believes that I will be a success; I do interesting activities; I help decide things like class activities;* and *I do things that make a difference*." The response scale was 1 *not at all true*, 2 *a little true*, 3 *pretty*

much true, and 4 *very much true*. The CHKS data set had a computed School Environment Scale score, which was the average score for all nine questions.

Since the literature presented a robust amount of research linking school connectedness and resiliency, a reliability correlation test was used to assess their relationship. The Cronbach alpha coefficient, 0.864, indicated a high level of internal consistency and correlations between each scale. Since there were only two correlated variables, the unweighted average of School Connectedness Scale and School Environment Scale scores were computed to create a School Connectedness variable. The School Connectedness Score had a range from 1 to 5, with a score of 1 being most connected.

School Climate

Data from the California School Climate Survey (CSCS) was utilized to measure school climate for this study. The CSCS is given to school staff every two years through the CDE and WestEd in conjunction with the CHKS for students. The survey is the companion survey for the CHKS and helps assess necessary student learning and teaching supports (WestEd, 2011). The CSCS questions assess ten educational domains to provide key data on learning and teaching conditions, barriers, and supports that exist within a school culture (Austin & Duerr, 2011). The literature suggests that school climate is determined by the following school culture factors: learning and working environment, student resiliency and developmental supports, and staff collegiality and sense of mission documented (Freiberg, Driscoll, & Knights, 1999; Hoy & Hannum, 1997; Loukas & Robinson, 2004; Shindler, Jones, Taylor, & Cadenas, 2004). The ten educational domains within the CSCS were analyzed to ascertain comparable subgroups of

questions that could represent school climate and culture established from past literature and research.

The CSCS addresses the educational domains for school climate through an array of question subgroups. The following survey questions represent the corresponding topic or domain: "*This school… is a supportive and inviting place for staff to work; promotes trust and collegiality among staff* (staff working environment). *How many adults at this school... really care about every student; acknowledge and pay attention to students; listen to what students have to say* (caring relationships). *How many adults at this school... want every student to do their best; believe that every student can be a success* (high expectations). *How many adults at this school ... have close professional relationships with one another; support and treat each other with respect; feel a responsibility to improve this school* (staff collegiality). *This school… is a supportive and inviting place for students to learn; sets high standards for academic performance for all students; promotes academic success for all students; emphasizes helping students academically when they need it; emphasizes teaching lessons in ways relevant to students* (norms and standards). *This school… gives all students equal opportunity to participate in numerous extracurricular and enrichment activities; gives students opportunities to 'make a difference' by helping other people, the school, or the community* (meaningful opportunities to participate)."

Construct validity for school climate was assessed by performing a factor analysis on survey questions related to the education domains connected to school climate in the literature (Table 3). Seventeen questions were found to represent 6 school climate related domains. The factor analysis converged the 17 questions into two components or factors. The overlying theme of the questions within the two factors was connected to either school relationships or student

Table 3

Rotated Component Matrix for School Climate Variable

Variable (Survey Question Number)	*SR*	*SLE*
Supportive and inviting place for students to learn (Q6)	0.554	0.676
High academic standards for all students (Q7)		0.800
Promotes academic success for all students (Q8)		0.875
Helps students academically when they need it (Q9)		0.608
Teach lessons in ways relevant to students (Q11)		0.711
Supportive and inviting place for staff to work (Q12)	0.719	
Promotes trust and collegiality among staff (Q13)	0.766	
Opportunities for students to participate in activities (Q18)		0.728
Gives students opportunities to help other people (Q19)		0.680
Adults really care about every student (Q33)	0.552	0.582
Adults acknowledge and pay attention to students (Q34)	0.672	
Adults want every student to do their best (Q35)	0.685	0.538
Adults listen to what students have to say (Q36)	0.773	
Adults believe that every student can be a success (Q37)	0.687	0.529
Adults have close professional relationships (Q40)	0.871	
Adults support and treat each other with respect (Q41)	0.929	
Adults feel a responsibility to improve this school (Q42)	0.780	

Note: SR = School Relationships factor, SLE = School Learning Environment factor, Q = Question

learning environment. The factor, School Relationships, was created by computing the sum of 7 questions related to caring relationships, high expectations, collegiality, and working environment. The range of School Relationship scores was 7 to 35, with a score of seven having

the strongest school relationships. The factor, Student Learning Environment, was created by computing the sum of 10 questions related to norms and standards and meaningful opportunities to participate. The range of School Learning Environment scores was 10 to 50, with a score of 7 having the strongest school learning environment.

After examining the factor loadings, the following four questions cross-loaded into both factors: "*This school…is supportive and inviting place for students to learn* (Q6)*; How many adults at this school…really care about every student* (Q33)*; want every student to their best* (Q35)*;* and *believe that every student can be a success* (Q37)." Cross-loading means that a question had a significant, 0.5 or greater, correlation with the questions in each factor. For any questions that cross-loaded into each factor, the content of the questions was examined. Question 6 addressed the norms and standards at the school and was therefore moved into the Student Learning Environment factor. Since question 33 was connected to caring relationships, it was moved into the School Relationship factor. Question 35 and 37 related to high expectations and were also moved into the School Relationship factor.

The two school climate factors created through the factor analysis, School Relationships and Student Learning Environment, were both comprised of more than two questions. Therefore, each factor was computed using the factoring loadings coefficients to weight the variables appropriately. The School Relationship score had a range from After the factor analysis, the Cronbach's alpha for each factor was computed to check for reliability (see Table 4). The Cronbach alpha for both factors representing School Climate illustrated a high level of internal reliability.

Table 4

Reliability Statistics for the School Climate Factors

Variable	*Cronbach's Alpha*
School Relationships	0.958
Student Learning Environment	0.925

School Demographics

The independent variables representing school demographics were attained from the California Department of Education API Data Files. Asian, Hispanic or Latino, Black or African American, and English Learners were percents based on student populations in the selected schools. The Parent Education Level was an average percent score based on the following scale: 1 – Not High School Graduate, 2 – High School Graduate, 3 – Some College, 4 – College Graduate, and 5 – Graduate School.

Descriptive Statistics

A total of 263 non-Title I high schools were examined in this study (Table 5). The largest average ethnic demographic was White students (51.8%), followed by Hispanic or Latino (23.9%), Asian (12.2%), and Black or African American (3.7%). On average, 6.3% of the student population was English Learners. The average parent education level for the sample was 3.5, with a score of three representing "some college" and a score of four representing "college graduate". The mean UC a-g course completion rate for the sample was 49%, with a range from 8% to 100%. The average API score for schools was 817 on a scale of 200 to 1000, where a score of 800 is the California benchmark for success.

Table 5

Descriptive Statistics of the Correlate Variables for Academic Achievement (N=263)

Variable	*Mean*	*SD*
API Score	817.38	54.29
Percent Asian	0.12	0.16
Percent Hispanic or Latino	0.24	0.16
Percent Black or African American	0.04	0.04
Percent English Learners	0.06	0.05
Average Parent Education Level	3.47	0.51
Percent AP Scores greater than 3	0.66	0.16
Percent SAT Scores greater than 1500	0.65	0.16
Percent AP Exam Takers	0.38	0.26
Percent SAT Exam Takers	0.51	0.37
UC a-g Completion Rate for Graduates	0.49	0.16
School Connectedness	3.18	0.14
School Relationships	9.93	1.23
Student Learning Environment	16.25	1.89

NOTE: Percent and rates are in ratio form. Parent Education Level and School Connectedness scores range from 1-5. School Relationships scores range from 7-35. School Learning Environment scores range from 10-50.

Correlation Results

The Pearson correlation was utilized to determine the statistical significance of each variable (Table 6). The Pearson correlation tells you the magnitude and direction of the association between variables that are on an interval or ratio scale. A total of 263 high schools

had valid data for every variable (Agresti & Finley, 2009). All six independent academic variables had a p-value of less than 0.05 in relation with the dependent variable, API score. Significance level refers to the probability of an event not occurring by chance. The significance levels most commonly used in educational research are the .05 and .01 levels (Fraenkel & Wallen). All five student demographic independent variables were statistically significant, as well.

The correlation in Table 6 results suggest two rigorous academic variables have a negative relationship with the variable representing academic achievement, API score. The percent Hispanic or Latino, percent Black or African American, percent English Learners, percent AP and SAT exam takers, and percent AP and SAT proficient scores all demonstrated a negative correlation with API score. This negative correlation indicates that when the percent is high for the correlated independent variables the dependent variables is low. In this case, as the percent of Hispanic or Latino, Black or African American, or English learner students increases, API scores decrease. Additionally, school API score was low when there was a high percent of AP and SAT exam takers and proficient scores. A positive correlation was revealed between API score and Asian students, parent education level, UC a-g course completion rate, School Connectedness, School Relationships, and School Learning Environment. The strongest correlation coefficients with API score were Parent Education Level, 0.77, UC a-g completion rate, 0.69, percent Asian, 0.58, percent Hispanic or Latino, -0.58, and School Connectedness, 0.56, where $p<.05$ for each variable. The weakest correlations were percent AP and SAT exam takers, -0.10, and percent AP and SAT proficient scores, -0.13, where $p<.05$ for each variable. The correlation coefficient explains the magnitude or strength of linear dependence between each

Table 6

Pearson Correlation for Key Variables

	API	AS	HI	AA	EL	PEL	PET	PPS	UC	SC	SR	SLE
API	1	.583*	-.581*	-.331*	-.461*	.766*	-.104*	-.128*	.694*	.556*	.453*	.275*
AS		1	-.321*	-.047	-.008	.448*	-.034	-.056	.490*	.078	.192*	.013
HI			1	.221*	.676*	-.620*	.102	.170*	-.475*	-.502*	-.212*	-.128*
AA				1	.067	-.197*	-.031	.027	-.264*	-.442*	-.088	-.214*
EL					1	-.403*	.073	.058	-.228*	-.403*	-.243*	-.109*
PEL						1	-.050	-.102*	.692*	.499*	.293*	.115*
PET							1	.518*	-.018	-.039	.031	-.011
PPS								1	-.110*	-.028	-.002	.032
UC									1	.491*	.303*	.133*
SC										1	.426*	.429*
SR											1	.741*
SLE												1

Note: API = Academic Performance Index, AS = Asian, HI = Hispanic or Latino, AA = Black or African American, EL = English Learners, PEL = Average Parent Education Level, PET = Percent AP and SAT Exam Takers, PPS = Percent AP and SAT Proficient, UC = UC a-g completion rate, SC = School Connectedness, SR = School Relationships, SLE = School Learning Environment
*$p < .05$.

independent variable and the dependent variable (Warner, 2008). The greater the correlation coefficient is, the stronger the association between two variables.

Regression Analysis

In the literature review, no previous research indicated that academic rigor, school connectedness, or school climate had a greater value each other in relation to academic achievement. Hence, a simultaneous regression model was utilized rather than a hierarchal regression. A simultaneous regression model allows each variable to be entered at the same time rather than by steps, as utilized with the hierarchal regression model (Agresti & Finley, 2009). A hierarchal regression is used when certain independent variables are known to have greater influence on the dependent variable. A simultaneous regression represents only the unique variance of each predictor variable, which will indicate which variables are most influential individually. Variance is a measure of the distribution of data points around their average value. In other words, variance describes how far the actual values lie from the mean, or expected value (Agresti & Finley, 2009).

A simultaneous regression was conducted as the primary analysis after completing the factor analyses. A two block entry method was used with the simultaneous regression to control for student demographics which have been extensively documented as the most significant factor for academic achievement (Baydar, Brooks-Gunn, & Furstenberg, 1993; Bradley & Corwyn, 2002; Coleman et al, 1966; Gottfried, Gottfried, Bathurst, Guerin, & Parramore, 2003; Liaw & Brooks-Gunn, 1994; Shakiba-Nejad & Yellin, 1981; Sirin, 2005). The first block contained the following school demographics for students: percent Asian, percent Hispanic or Latino, percent Black or African American, percent English Learners, and average parent education level. The

second block for the regression included the following six academic related independent variables: percent exam takers, percent proficient scores, UC a-g completion rate, school connectedness, school relationships, and student learning environment.

In the multiple regressions, the proportion of variance in API score that could be explained was 80.8%. As mentioned above, the first block of the regression model consisted of the five student demographics for each school. The second step included the first block and the second block discussed above, containing the six independent variables. Each independent variable block was statistically significant ($p < .05$). The coefficient of determination, or R Square, was used to measure how well future outcomes are likely to be predicted by the model. In this study, Model 1 accounted for 75.6% of the variance in academic achievement, or API score. The six additional academic environment independent variables included in Model 2 explained an additional 5.2% of the variance in academic achievement.

The results of the regression analysis are presented in Table 7. All individual independent variables remained statistically significant, with the exception of percent AP and SAT exam takers, percent AP and SAT proficient scores, and student learning environment. After the statistical analysis controlled for the student demographics, the only statistically significant measure of rigor was University of California (UC) a-g course completion rate. Even though the SAT and Advanced Placement (AP) exams are often viewed by the education community as a measure of rigor, data related to these exams did not influence a school's API score, which is the cornerstone of the California Department of Education's (CDE) academic accountability requirements (CDE, 2010).

Table 7

Summary of Regression Analysis for non-Title I High School Academic Achievement (N = 263)

Variable	Model 1				Model 2			
	b	*SE*	β	Part Correlation	*b*	*SE*	β	Part Correlation
API Score (Constant)	642.43	17.36			623.19	60.90		
Asian*	130.27	12.28	0.39	0.33	119.60	12.03	0.36	0.28
Hispanic or Latino*	39.74	17.89	0.11	0.07	48.65	16.77	0.14	0.08
Black or African American*	-273.27	39.80	-0.22	-0.21	-198.24	39.84	-0.16	-0.14
English Learners*	-328.06	45.07	-0.32	-0.22	-293.72	42.20	-0.29	-0.19
Parent Education Level*	51.91	4.46	0.49	0.36	37.75	4.73	0.36	0.22
Percent AP and SAT Exam Takers					-17.38	10.44	-0.06	-0.05
Percent AP and SAT Proficiency					-10.44	11.88	-0.03	-0.02
UC a-g Course Completion Rate*					46.35	14.23	0.14	0.09
School Connectedness Score*					38.35	16.76	0.10	0.06
School Relationships Score*					5.30	2.06	0.12	0.07
School Learning Environment					0.94	1.31	0.03	0.02

*$p < .05$.

Further disaggregation related to the SAT and AP exam data might explain this lack of relationship in non-Title I high schools. Although the mean for percent of proficient SAT and AP test scores was 65%, the mean for percent of exam takers was only 43% of the eligible student population. Additional disaggregation of the data indicates that only 51% of grade 12 students took the SAT exam and 38% of grade 11 and 12 students took an AP exam. Conversely, the state of California requires that schools must have at least 85% of the eligible student population take the California Standards Test (CST) and California High School Exit Exam (CAHSEE), which account for nearly all of the API score. Hence, unless the percent of SAT and AP exam takers encompasses a percentage of the student population comparable to the API standard of 85%, the percent of proficient scores on the SAT and AP exam would logically not have a significant impact on a school's API score.

Another explanation for the uncorrelated relationship between the API score and SAT and AP exams in non-Title I high schools is the grade level of students. Since the API score is based on the CST and CAHSEE scores, only students in grades 9, 10, and 11 are assessed. The published SAT exam-taking percent is based on the number of grade 12 students. The AP exam-taking percent is based on students in grades 11 and 12.

In addition, any AP exam related data are based on courses that are generally viewed as being college-level courses, which are not the 55 ity of courses offered in high schools. In comparison, the one correlated measure of rigor for this study, UC a-g course completion rate, is calculated from the number of grade 12 students that receive a C or higher in a large set of standards-based courses from grades 9 through 12. This potential set of courses for schools not only includes AP courses, but also Honors and many non-Honors courses, therefore encompassing the majority of courses high schools offer.

The unstandardized coefficients, or the *b* values, in the regression analysis are measured in their natural units and predict the change in the dependent variable for every one percent change in the corresponding independent variable. Using the regression equation specific to this study, the regression analysis predicted that for every one percent change in the percent of Asian students API score would increase 120 points ($p<.05$). In the opposite direction were the percent Black or African American students and English Learners with a negative change in API score of 198 and 293 points, respectively ($p<.05$; $p<.05$). The large change in API score related to these three variables was influenced by the correlated strength of the relationship and small mean of each student demographic in non-Title I high schools (12.2% Asian, 3.7% Black or African American, and 6.3% English Learner). In other words, since the student demographic variables had such a strong relationship with API score, but the demographic variables were a small percentage of all students, a slight change in demographics predicts a large change in school API score.

To further clarify the relationship between the independent variables and the dependent variable, percents and scores of the variables were standardized in relation to API score. The standardized coefficients, or Beta values, place all independent variables on a standardized scale. The Beta values take into account the t-values so that the magnitude of the coefficients can be compared to see which one has more of an effect. The greatest Beta values in the regression were the average parent education value, 0.36, and percent Asian, 0.36. In the regression model for this study, these statistics indicate that having more students with educated parents and a higher population of Asian students tended to be the strongest predictors of API performance. The main variables of interest, the UC a-g course completion rate, school relationships, and school connectedness, had Beta values of 0.14, 0.12, and 0.10, respectively. Thus, the predictive

coefficients of the variables of interest were positive and significant, even after controlling for the relationship between student demographics and API score.

One of the problems related to multiple regressions is defining the contribution of each independent variable to the multiple correlations (Agresti & Finley, 2009). The part correlation values were calculated to determine the unique contribution predicted by each independent variable. The part correlation is the portion of the total variance in the dependent variable that is by only that independent variable. The statistically significant independent variables with the greatest unique contributions were Asian, 0.28, Parent Education Level, 0.22, English Learners, -0.19, and Black or African American, -0.14. Interestingly, all four of these variables are student demographics that school do not have control of. The other significant independent variables, UC a-g Course Completion Rate, Hispanic or Latino, School Relationships Score, and School Connectedness Score, had unique contributions to the dependent variable of 0.09, 0.08, 0.07, and 0.06, respectively. Three of the previous four variables are factors school can improve and change. In addition, when using a ratio comparison between the demographics and academic variables, the academic variables have between 30-40% of the predictability strength as the demographic variables.

Summary

Academic rigor, school connectedness, and school climate predicted increases in API score, when controlling for other student and school variables. Specifically, the three academic variables account for 5% of the variance in API scores for schools. The multiple regression analysis indicated that the variables for UC a-g course completion rate, school relationships, and school connectedness were statistically significant. After controlling for the overlapping

variance between variables, the multiple regression models suggested that the predictability of the academic variables was only 30-40% of the predictability of student demographic variables when comparing unique contributions to academic achievement or API score. That is a noteworthy proportion of academic achievement that schools are in control of and have the ability to change.

CHAPTER FIVE

Discussion

Introduction

Nearly 50 years ago, the US Government published the controversial Coleman Report. The Coleman Report concluded that family background and socioeconomics, not schools, had the greatest impact on student achievement. The Coleman Report would also drastically change the way educational policy research was conducted, as it assessed student opportunity based on results rather than implementation. The results of this study further supported the idea that student demographics have the greatest influence on academic achievement. However, the results were also very clear that school culture can also have a significant influence on academic achievement in all schools, regardless of the SES level for students.

For the student population in this study, non-Title I high school students, there are no quick fixes. This study reinforced previous research that suggested the major portion of standardized test scores is determined by student demographics, which is not a factor schools can control (Bradley & Corwyn, 2002; Coleman et al, 1966; Gottfried, Gottfried, Bathurst, Guerin, & Parramore, 2003; Shakiba-Nejad & Yellin, 1981; Sirin, 2005). Nevertheless, the findings suggest that improvement in academic achievement in non-Title I high schools can come from changing the school connectedness and relationships through improvement in school climate and connectedness. So while legislators continue to write education policy and assign accountability based on standardized test scores, improving student learning in higher SES high schools is less likely to come from something tangible, like improving student learning on test scores, and more likely to come from changes to school structures and culture.

The following research questions were developed to examine the relationship between student achievement and rigor, connectedness, and climate in higher SES high schools:

1. What is the relationship between the level of academic rigor and academic achievement in non-Title I high schools?
2. What is the relationship between student perceptions of school connectedness and academic achievement in non-Title I high schools?
3. What is the relationship between staff perceptions of school climate and academic achievement in non-Title I high schools?

The discussion and recommendations for this secondary data analysis study are summarized in the subsequent sections of this chapter. The first discussion will address the impact on academic achievement from less definable and concrete school culture variables, school connectedness and school relationships. Next, seven specific recommendations to improve school culture in non-Title I High Schools will be given. Then a discussion will follow about a finding related to the multiple measures of academic rigor and their relationship, or lack thereof, with the API score for non-Title I high schools. Finally, the limitations of the research, implications for policy-makers, and implications for future research will be addressed.

The Impact of School Culture on Academic Achievement

Politicians, school boards, and administrators have focused on the standards-based accountability movement for most of the last two decades. With student demographics as the greatest determinant of academic achievement, it is no surprise that low SES schools have consistently been in the spotlight. The US government allocates $14 billion a year to support Title I, or high poverty, schools, which are mostly attended by minorities (US Department of Education, 2011). So when politicians and educators find an outlier among the high poverty and minority schools, the typical action is to research what they are doing and replicate it. This type of reaction assumes that the problems, and corresponding solutions, for every school are the

same without regard to SES, ethnicity, parent education, and neighborhood support and safety. This type of reaction could be troublesome since few educational policies differentiate between the many different demographics of schools. In fact, the more diverse a school's demographics are, the more school data the federal (AYP) and California (API) measures of success will examine in detail.

This study sought to determine what type of educational strategies and practices would improve academic achievement in non-Title I high schools, where little research has occurred. The lack of research in this demographic likely occurs because high SES schools achieve higher on standards-based assessments due to the student population demographics being in their favor. This study confirmed this view when student demographics accounted for 75.6% of the variance in API score. The notion is further corroborated by the fact that the average API score for the approximate 2000 California high schools in 2010 was 675. While the average API score the non-Title I high schools in this study was 815, nearly 20% higher.

The variables included in the regression analysis in this study accounted for a total of 81% of the variance in API score. Consistent with past research, the majority of academic achievement was statistically accounted for by student demographics. However, 5% of the accounted for variance was from academic variables, which unlike student demographics, schools can change. The UC a-g course completion rate, school relationships score, and school connectedness score were all statistically significant after the student demographic variables were controlled for. Although the student demographic variables had a stronger influence on API scores for non-Title I high schools, the variables educators can have an effect on–UC a-g course completion rate, school relationships, and school connectedness–impacted API scores 30-40% of the highest rate of the student demographics variables. Considering the majority non-

Title I high schools already have an API score above 800, the California API benchmark score for success, these schools clearly have the capacity to further improve their API score.

So what areas should non-Title I high schools focus on in order to improve academic achievement? School Connectedness and School Relationships scores were both statistically significant predictor variables for API score. What both variables represent is much less concrete than the standardized test scores school are used to concentrating on.

Schools with a strong connectedness on their campuses variable had students who feel a sense of belonging to the school and believe that teachers are fair, care about them, and give them relevant opportunities to participate. Students who felt strongly connected to school agreed with questions such as: "*I feel close to people at this school; the teachers at this school treat students fairly; at my school, there is a teacher or some other adult who notices when I'm not there…who listens to me when I have something to say…who always wants me to do my best; at this school, I do things that make a difference.*" These types of statements are directly related to Resilience Theory. Resilience is a capacity to deal with change and still develop (Benard, 1991). The capacity to be resilient has mainly been studied in more low SES schools, where the environment is much more demanding and challenging for kids to be successful, not in higher SES schools, where demographics play to their advantage. These statements send a clear message to teachers in non-Title I high schools about what students need out of them in order to be academically successful. Students need to know that teachers believe what students are doing is important, that they believe the students can do it, and that they are going to support students in doing it.

Schools that have strong relationships between students, staff, and administration clearly exhibit trust and care in each other. School staffs that felt they have strong relationships agreed with statements such as: "*This school promotes trust and collegiality among staff…is a*

supportive and inviting place for staff to work." Staff members also answered that most adults at the school: "*really care about every student… listen to what students have to say… believe every student can be a success… support and treat each other with respect…feel a responsibility to improve this school.*" Many of these statements are similar to the resilience related questions students made to indicate strong school connectedness. Staff at non-Title I high schools with robust school relationships also believed that most of their colleagues really cared about all students and wanted every student to be successful. School staffs need a supportive, collegial, and trusting work environment.

Recommendations to Improve School Connectedness and Relationships

Resilience theory has been well-documented in low SES schools and students that overcame social and economic challenges (Benard, 2004; Hanson& Austin, 2003; Reyes & Jason, 1993; Solberg et al., 1998;Toldson, 2008). This study suggests that even in high schools with fewer economic and demographic challenges, such as non-Title I high schools, resiliency, relationships, and connectedness were still important, and might be some of the few factors educators in these schools can influence to improve student achievement. Previous research consistently pointed toward the following seven strategies to improve school culture by means of building resiliency and fostering connectedness.

Increase caring relationships. Providing care and support on a school campus might be the most important strategy to overcome adversity (Benard, 1996; Ryan & Patrict, 2001; Wang, Haertel, & Walberg, 1998). School teachers and administrators demonstrate caring relationships by acknowledging all students, seeking out students that are uninvolved, knowing student names, intervening when problems occur, discussing academic expectations, expressing respect, listening, and having follow-up conversations on academic and social challenges. Students are

more likely to perform tasks they are not motivated to do for people they trust (Henderson & Milstein, 2003). Compassion, understanding, active listening, and respect communicate to students that teachers care about them (Gibbs, 1998; Kannapel and Clements, 2005).

Set high expectations. Communicating high expectations has been shown to contribute to academic achievement and good behavior (Benard, 2004; Learning First Alliance, 2001; Reeves, 2003; Shannon & Bylsma, 2007). It is also important that academic support is provided along with high standards for students (Learning First Alliance, 2001). Conversely, lowering expectations for students is likely to lower their confidence (Battistich, Watson, Solomon, Lewis, & Schaps, 1999; Learning First Alliance, 2001; Wang, Haertel, & Walberg, 1998). High expectations are communicated through meaningful activities, higher-order thinking problems, assessments that acknowledge multiple learning styles, active practice, heterogeneous grouping, and connections to the local community (Henderson, 1997).

Provide opportunities for meaningful participation. Activities that have meaning and value to students improve academic achievement by engaging and connecting to students at a high level (Be nard, 1996; Zimmerman & Arunkumar, 1994). An important step in utilizing this strategy is viewing students as resources and giving them ample responsibility to plan for school-wide events, have a voice in decisions, set goals, be a part of the solution to big problems (Brooks, 2006; Henderson, 1997). Students should participate in decision-making committees, peer-to-peer problem solving, and service learning programs. Collaborative event planning and class assignments also promote meaningful participation. All levels of students should be encouraged to take part in these types of autonomy-building activities (Learning First Alliance, 2001; Slavin, 1996).

Teach social skills. Another method to foster resiliency is through developing social competence (Benard, 2001; Wang, Haertel, & Walberg, 1998). Social development is also

supported by a collaborative learning environment. Learning to work effectively with peers to reach a common goal is much closer to reality than the individual learning model most schools have employed for so long. Some of the life skills necessary for social competence are conflict resolution, relationship building, decision making, emotional awareness, and effective communication. Consistently working with other students on meaningful activities is an important part of building resiliency (Henderson & Milstein, 2003).

Set clear and consistent policies. Applying fair and consistent behavior policies gives students a sense of security and justice that allows encourages students to participate more and take risks (Benard, 2004). Expectations and policies should be transparent, clearly communicated, and consistently enforced (Visher, Teitelbaum, & Emanuel, 1999). Developing policies and consequences is a meaningful process students can be a part of at school (Henderson, 1997).

Develop relationships with families and the community. Resiliency is impacted by the people students are most connected to, whether it is a teacher, parent, or community member (Wang, Haertel, & Walberg, 1998). With this in mind, schools should develop partnerships with families and communities to continue resiliency develop beyond the school walls (Cotton, 2001; Connell & Halpern-Felsher, 1997). Schools that best foster relationships with families and the community create a welcoming environment, host parent education workshops, communicate frequently and consistently, and are transparent in all actions. Schools should invite community members to be a part of regular school operations and events, such as guest speaking, fundraising, supervising, organizing special programs and clubs throughout the school day, tutoring, communication, and campus beautification (Barth et al., 1997; Fan & Chen, 1999; Henderson, 1997).

Increase resilience in school staff. Courageous and involved leadership is crucial in developing strong connectedness and relationship among staff. Each previously suggested strategies should be modeled with teachers by school administrators, as well. Administrative leaders should develop school structures that support and expand staff resiliency (Doherty & Duckworth, 1986; Henderson & Milstein, 2003). Staff members must participate in meaningful decision making and problems solving opportunities. Principals should set clear, transparent, and high expectations for teachers, but also support, train, and have reflective conversation with them (Carlson, Shagle-Shah, & Ramiriz, 1999). A key piece in fostering caring and supportive relationships with teachers that is often overlooked is recognizing, rewarding, and celebrating big and small accomplishments (Darling-Hammond, 1999).

Turning school connectedness and relationships, two hard-to-define concepts, into a concrete set of developable skills is essential for high-achieving non-Title I high schools that aspire to achieve more. Resiliency theory provides a tangible and extensive framework to make it happen. Previous literature suggests seven key strategies to improving student resiliency: increase caring relationships, set high expectations, provide opportunities for meaningful participation, teach social skills, set clear and consistent policies, develop relationships with families and the community, and increase resilience in school staff. School leaders that effectively implement these seven strategies will foster a school environment that is ideal for student learning.

The Relationships between Multiple Measures of Rigor and API Score

Is the API score a rigorous measure of academic achievement for California non-Title I high schools? One of the most troubling findings in this study is the non-statistically significant relationship between proficient scores on the SAT and AP exams and school API scores after

controlling for student demographics. The difference in the grade level of students and selection of courses assessed to calculate API, AP, and SAT scores creates a mismatch for measuring academic rigor. The formula for a school's API score does not take into account highly rigorous assessments, like the SAT and AP exams. Instead, less rigorous measurements of academic achievement, the CST and CAHSEE, encompass the state of California measurement for academic performance and growth.

For high performing non-Title I high schools, a high API score does not necessarily mean there is a high level rigor in classes. In order to truly measure rigor, non-Title I high schools should utilize and analyze the percent of AP test takers and the percent of proficient AP test scores. The strongest indicator that a student will attain a college degree is a rigorous high school curriculum (ACT, 2004). Schools can compare AP data longitudinally and with other schools that have similar student demographics. AP classes and tests are clearly college-equivalent courses in relation to rigor. Research related to students who complete an AP course and exam versus students who do not, indicates that AP students are likely to take more advanced courses, choose challenging majors, and twice as likely to go on to advanced study (Camara, 2003).

Additionally, colleges should reflect on the use and impact of the SAT test score as a measurement for future student success. The continued utilization of the SAT for college admissions only reinforces the disconnect between college admissions and high school curriculum. Is there a measurement of student knowledge that is linked more closely with high school curriculum? Bringing together high school and college expectations and outcomes has been a well-documented problem that has made little progress in the past (ACT, 2007; Culpeper, Basile, Ferguson, Lanning, & Perkins, 2010). As nearly every state transitions to the national or

Common Core State Standards, this previously complicated and well-treaded idea might finally have some traction.

Limitations of Current Research

There are some limitations to the validity and generalizability of the results. Although the regression analysis included 263 California high schools, this set of schools only represents a third (33.9%) of all non-Title I high schools in California. High schools that fit the following criteria were not included: Title I or 40% or higher free and reduced lunch, less than 100 valid CST scores, less than 50% of students in grades 9-11, and incomplete data in any of the six academic related independent variables. The 2010 API database included 776 non-Title I high schools. Small schools or schools with less than 100 valid CST scores were removed next, leaving 499 schools. Finally, 263 schools remained after subtracting schools with incomplete independent variable data. Second, the CSCS must be offered to all certificated staff working in grades 5 through 12 in all schools that are participating in the CHKS student survey. This is required to obtain a large enough sample to have confidence that the results are truly representative of the school and to maintain school anonymity. Yet, school staffs are not required to participate in the CSCS. Third, the CHKS is only administered to students in grades 9 and 11 and the minimum participation rate per grade level is 60%. In addition, if a district has over 10 schools per grade level, schools can be randomly chosen for participation. Fourth, the major limitation of the regression is that the relationship can only be established. Regression analysis cannot prove causality; rather it can only substantiate or contradict causal assumptions.

Implications for Educational Policy-Makers

Policy-makers need to recognize that not all schools have the same needs. Policy-makers at the state and local district levels continue to use state-mandated standardized test results as the focal point for school performance and growth. This study suggests many other variables should be considered, including student surveys, Advanced Placement exam results, and SAT exam results. Policy-makers at the local district level should support their school staff and students financially and structurally with more non-standards related outcomes, such as practices that assist and encourage student resiliency.

Implications for Future Research

The findings from this study suggest an increased focus on fostering resiliency traits for students in higher SES schools. Further case studies on individual non-Title I high schools that demonstrate high scores in school connectedness, relationships, and resiliency should be studied to better understand the causality behind the scores. The same school variables should be researched in elementary and middle schools, as well.

Summary

Standardized test scores continue to the ultimate measure of school success. With $14 billion in annual federal funds directed towards low SES or Title I schools, the stakes are as high as they have ever been for schools. Policy-makers are dangling grants, takeover, closure, and everything in between for schools, all based on test scores. For non-Title I schools, a different story is being plays out. Student demographics – the greatest predictor of academic achievement – play in their favor. Judged by the test scores from all socioeconomic areas, non-Title I high schools appear to be consistently successful. On the surface, there appears to be no impetus to

improve student learning. Yet, disaggregation of achievement data found minimal improvement in academic achievement during the last 12 years in non-Title I high schools. The relationship between student demographics and academic achievement leaves no quick fixes for non-Title I high schools. However, the findings from this study suggest a clear focus for non-Title I high schools that seek to improve academic achievement: improve school connectedness and relationships by fostering resiliency skills. This study recommends seven resiliency skill development strategies for non-Title I high schools to improve academic achievement. Educators need to challenge students academically with support, "This work is important; I know you can do it; I won't give up on you" (Howard, 1990). Developing resiliency skills needs to be at the fore-front for non-Title I high schools.

APPENDIX A: Definitions

Academic Performance Index (API): Cornerstone of California Public Accountability Act 1999. A numeric index (or scale) that ranges from a low of 200 to a high of 1,000. A school's score or placement on the API is an indicator of the school's performance level. The statewide API performance target for all schools is 800. A school's growth is measured by how well the school is moving toward or past that goal. The API score is calculated utilizing the percentages in the table below by grade level. (http://www.cde.ca.gov/ta/ac/ap/)

School Content Area Weights for the Most Common Grade Spans, 2010–11 API

Content Areas	K–5	6–8	9–12
CSTs, CMA, and CAPA			
English-Language Arts	56.5%	51.4%	27.1%
Mathematics	37.6%	34.3%	18.1%
Science	5.9%	7.1%	22.9%
History-Social Science	N/A	7.1%	13.9%
CAHSEE			
English-Language Arts	N/A	N/A	9.0%
Mathematics	N/A	N/A	9.0%

Note: Assumes an equal number of student test results at each grade level and no missing data.

Adequate Yearly Progress (AYP): A statewide accountability system mandated by the No Child Left Behind Act of 2001 which requires each state to ensure that all schools and districts make adequate yearly progress. AYP is a series of annual academic performance goals established for each school, LEA (Local Education Agency), and the state as a whole. Schools, LEAs, and the state are determined to have met AYP if they meet or exceed each year's goals (AYP targets and criteria). AYP is required under Title I of the federal ESEA (Elementary and Secondary Education Act of 1965). States commit to the goals of ESEA by participating in Title I, a program under ESEA that provides funding to help educate low-income children. The primary goal of Title I is for all students to be proficient in ELA and mathematics, as determined by state assessments, by

2014. Under California's criteria for ESEA, schools and LEAs are required to meet or exceed requirements within each of the following four areas in order to make AYP annually:

- Requirement 1: Participation Rate
- Requirement 2: Percent Proficient—Annual Measurable Objectives (AMOs)
- Requirement 3: API as an Additional Indicator
- Requirement 4: Graduation Rate

If a school or an LEA misses one or more requirement, it does not make AYP and may be identified for PI, or Program Improvement. (http://www.cde.ca.gov/ta/ac/ay)

Advanced Placement: Advanced Placement (AP) is a set of high school classes with curriculum designed to be at the college level. An AP class is designed to prepare a student to take an AP test at the end of the year. The AP test program is administered by the College Board, a non-profit organization based in New York. Students who pass the AP exams with sufficient scores may be awarded college credit. (http://www.collegeboard.com/student/testing/ap/about.html)

California Healthy Kids Survey (CHKS): The California Department of Education (CDE) funded the CHKS in 1997 to provide data that would assist schools in: (1) preventing youth health-risk behaviors and other barriers to academic achievement; (2) promoting positive youth development, resilience, and well-being; and (3) fostering positive school climates and engagement in learning. Since fall 2003, biennial administration of the survey (along with the California School Climate Survey of staff), and the public posting of the results, have been required by CDE in compliance with the No Child Left Behind Act. School staff administered the survey following detailed instructions provided by CDE designed to assure the protection of all student and parental rights to privacy and maintain confidentiality. Students were surveyed only with the *consent of parents or guardians*. Each student's participation was voluntary,

anonymous, and confidential. Several measures and procedures have been implemented in the CHKS to further ensure that data are reasonable estimates of behavior for all students. Students whose responses might not be valid because they did not take the survey seriously, were careless, or did not answer truthfully, are removed. When the CHKS data are processed, each participant's responses are examined for reliability (e.g., 30-day substance use should not be more frequent than lifetime use) and validity (e.g., reporting exaggerated substance use, such as daily for alcohol/marijuana/cocaine; WestEd, Jerry Bailey, personal communication, May 11, 2008). In all, there were seven response checks—students who did not pass three or more of these checks were considered to have provided implausible responses and were not included in this study. Anyone having access to the dataset must sign a Memorandum of Understanding to preserve this confidentiality. (http://chks.wested.org/about)

California School Climate Survey (CSCS): The California School Climate Survey must be offered to all minimally certificated staff working in grades 5 through 12 in all schools (including continuation schools) that are participating in the biennial CHKS student survey. This is necessary to obtain a large enough sample to have confidence that the results are truly representative (i.e., valid, not biased) and to maintain school anonymity. Although the CSCS is available to all staff, those who do not wish to participate are not required to do so. The survey must be completed online in one session. At the end of that session, results are submitted electronically to WestEd and can be viewed online. The survey is anonymous and all results are confidential. Background information is collected to enable districts and the state to determine how representative the respondents were of the general population and to enable analyses of the results by subgroups. However, to preserve confidentiality, no information is provided that is derived from any subgroups of less than five respondents. Anyone having access to the dataset

must sign a Memorandum of Understanding to preserve this confidentiality. (http://cscs.wested.org/about)

English Language Learners: Federal law (Title III of the Elementary and Secondary Education Act [ESEA]) and the state law (*Education Code [EC]* sections 313 and 60810 through 60812) require a statewide English language proficiency test that local educational agencies (LEA's) must administer to students in kindergarten through grade 12 whose primary language is not English and to students previously identified as English Learners (EL's) who have not be reclassified as fluent in English proficient (RFEP). *California Code of Regulations*, Title 5, Section 10510, defines the test as the California English Language Development Test (CELDT). (http://www.cde.ca.gov/ta/tg/el/)

No Child Left Behind Act (NCLB): The Act was designed to close the achievement gap with accountability, flexibility, and choice, so that no child is left behind. NCLB supports standards-based education reform, which is based on the belief that setting high standards and establishing measurable goals can improve individual outcomes in education. The Act requires states to develop assessments in basic skills to be given to all students in certain grades, if those states are to receive federal funding for schools. The Act does not assert a national achievement standard; standards are set by each individual state. (http://www2.ed.gov/policy/elsec/leg/esea02/index.html)

Parent Education Level: The Parent Education Level was an average percent score for each school based on the following scale: 1 – Not High School Graduate, 2 – High School Graduate, 3 – Some College, 4 – College Graduate, and 5 – Graduate School. This data was collected by the

California Department of Education through the annual CBEDS process. Parent education is reported directly to schools from parents during annual enrollments.

SAT: The SAT (empty acronym) helps college admissions officers make fair and informed admission decisions. Combined with a student's academic record, it is a proven, reliable indicator of college success. Since its launch in 1926, the SAT has helped millions of students connect with college success and today remains the most reliable, effective measure of a student's college readiness. The SAT tests the subject matter learned by students in high school and how well they apply that knowledge—the critical thinking skills necessary to succeed in college. It is designed to measure a student's ability to understand and process elements in three subjects: reading, writing, and math. The SAT Reasoning Test is a standardized test that assesses the critical reading, mathematics, and writing skills that students need to be successful in college. Each of the three sections that comprise the SAT Reasoning Test has a possible score of 800 points. SAT test results represent one factor considered by many colleges and universities in making admissions decisions.The SAT is owned, published, and developed by the College Board, a non-profit organization in the United States.
(http://professionals.collegeboard.com/testing/sat-reasoning/about)

Student Demographics: The statistical characteristics of the student population used in this study were Asian, Black or African American, English Learners, Hispanic or Latino, and Parent Education Level. The California Basic Educational Data System, otherwise known as CBEDS, is a system for collecting and sharing demographic data about students, schools, school districts, and classified staff in the California public school system in kindergarten through grade twelve (K–12). The data are collected annually in October. CBEDS data are reported through an Online

Reporting Application called CBEDS-ORA. Data are collected at the individual student level using Statewide Student Identifiers (SSIDs). These data are aggregated up to the school level and then combined with data collected through CBEDS for reporting purposes.

Title I: The purpose of Title I of Elementary and Secondary Act of 1965 is to ensure that all children have a fair, equal, and significant opportunity to obtain a high quality education and reach at a minimum, proficiency on challenging State academic achievement standards and state academic assessments. To qualify as a Title I school, a school typically has around 40% or more of its students come from families who qualify under the United States Census's definitions as low-income, according to the U.S. Department of Education. Title I states that it gives priority to schools that are in obvious needs of funds, low-achieving schools, and schools that demonstrate a commitment to improving their education standards and test scores. Assistance for school improvement includes government grants, allocations, and reallocations based on the school's willingness to commit to improving their standing in the educational system. Schools receiving Title I funding are regulated by federal legislation, including the No Child Left Behind Act. (http://www2.ed.gov/programs/titleiparta/index.html?src=rt)

UC a-g Course Completion Rate: Each California high school is given a University of California (UC) a-g completion rate based on the percent of senior students that meet the minimal UC a-g Subject Requirements in approved high school courses. In UC a-g courses, students must receive a grade of "C" or higher to validate course completion. The intent of the UC a-g Subject Requirements is to ensure that students can participate fully in the first-year program at the University in a wide variety of fields of study. The requirements are written deliberately for the benefit of all students expecting to enter the University, and not for preparation for specific

majors. UC faculty considers the Subject Requirements to be effective preparation, on many levels, for undergraduate work. This pattern of study assures the faculty that the student has attained a body of general knowledge that will provide breadth and perspective to new, more advanced study. Fulfillment of the a-g pattern also demonstrates that the student has attained essential critical thinking and study skills. (http://www.ucop.edu/a-gGuide/ag/a-g/welcome.html)

APPENDIX B: Units of Observation Chart

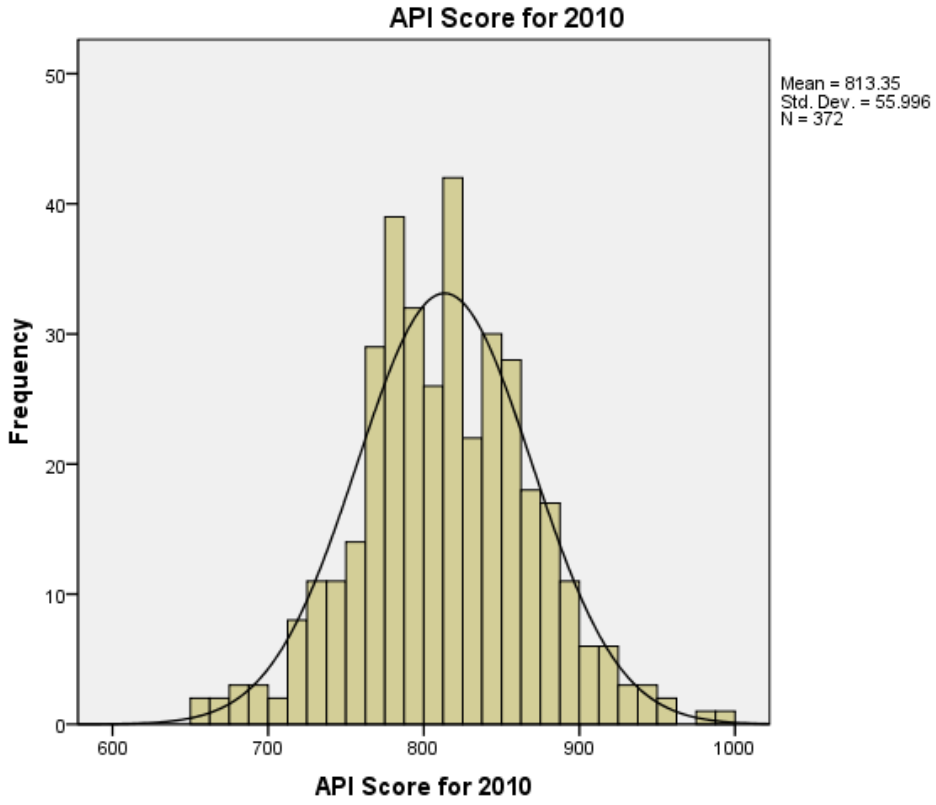
Research Question	Data Collection	Data Analysis
1) What is the relationship between the level of **academic rigor** and academic achievement in non-Title I high schools?	CDE Postsecondary Preparation data files •Percent AP test scores greater than or equal to 3 •AP percent tested •SAT percent tested •Percent of SAT scores ≥ 1500 California Post-Secondary Education Commission website database •UC a-g course completion rate	•Correlation between change in the number of AP test scores greater than or equal to 3 and API score •Correlation between change in the AP percent tested and API score •Correlation between change in UC a-g course completion rate and API score •Correlation between change in SAT percent tested and API score •Correlation between change in percent of SAT scores ≥ 1500 and API score
2) What is the relationship between student perceptions of **school connectedness** and academic achievement in non-Title I high schools?	California Healthy Kids Survey •Caring relationships score •High expectations score •Opportunities for meaningful participation score	•Correlation between change in caring relationships score and API score •Correlation between change in high expectations score and API score •Correlation between change in opportunities for meaningful participation score and API score
3) What is the relationship between staff perception of **school climate** and academic achievement in non-Title I high schools?	California School Climate Survey •Safe learning environment score •Norms and standards score •Student-staff relationships score •Student behaviors that facilitate learning score	•Correlation between change in safe learning environment score and API score •Correlation between change in Norms and standards score and API score •Correlation between change in student-staff relationships score and API score •Correlation between change in student behaviors that facilitate learning score and API score

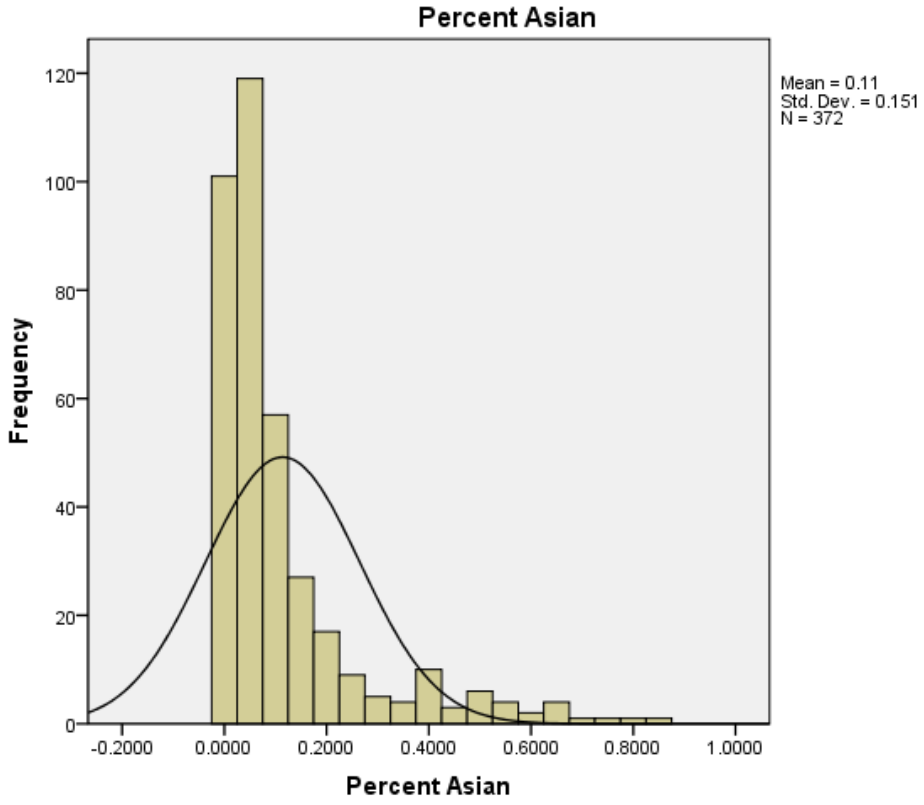
APPENDIX C: Site Selection Table

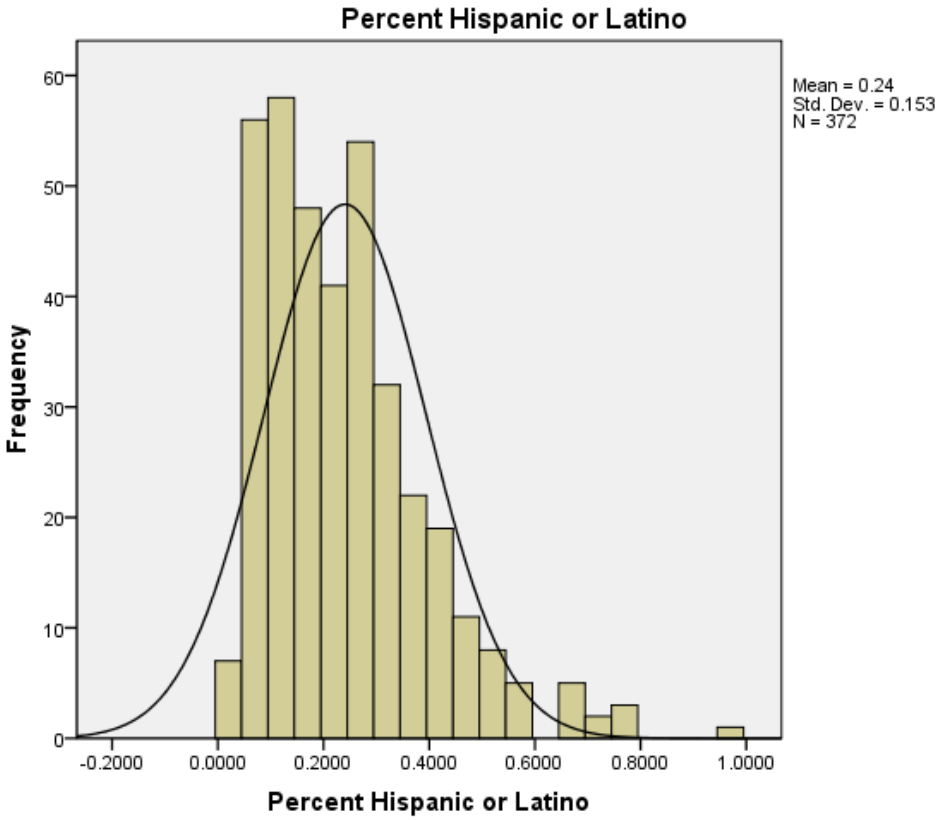
Description of School Site Selection

School Filter	*Number of Schools*
California schools	9,836
California non-Title I schools	1,909
California non-Title I high schools	776
California non-Title I high schools, excluding small schools (< 100 students)	499
California non-Title I high schools, excluding small schools (< 100 students) and incomplete independent variable data	263

APPENDIX D: Distribution of Variables






Percent Hispanic or Latino
Mean = 0.24
Std. Dev. = 0.153
N = 372
Frequency
60
50
40
30
20
10
0
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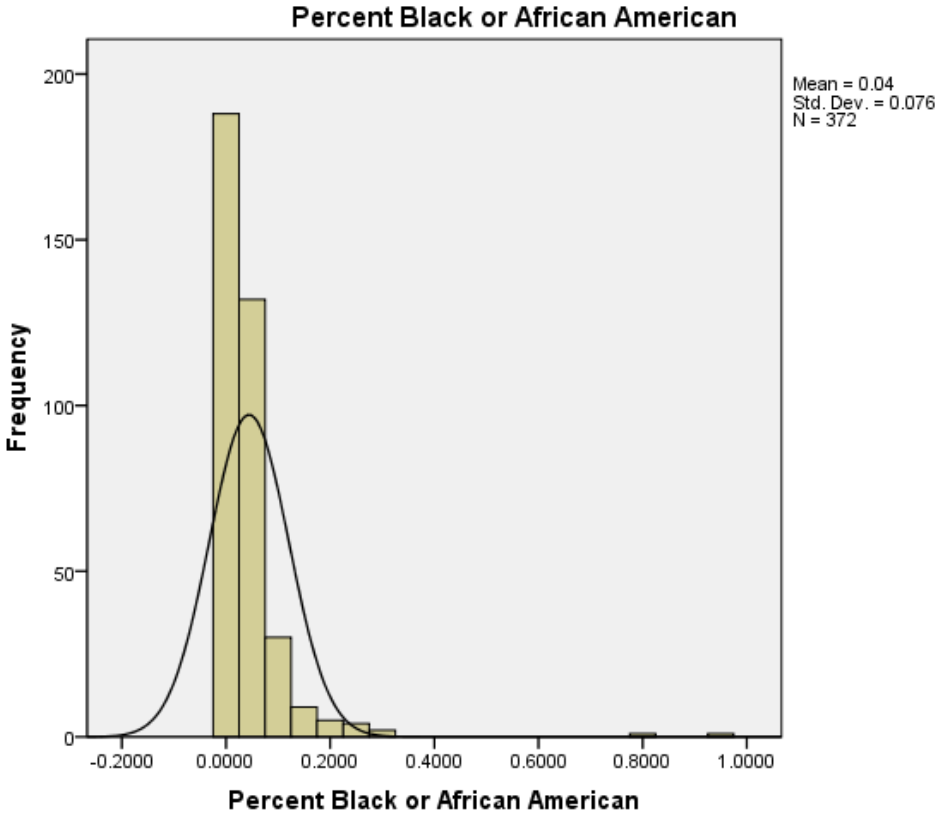
0.0000
0.2000
0.4000
0.6000
0.8000
1.0000
Percent Hispanic or Latino


Percent Black or African American
Mean = 0.04
Std. Dev. = 0.076
N = 372
Frequency
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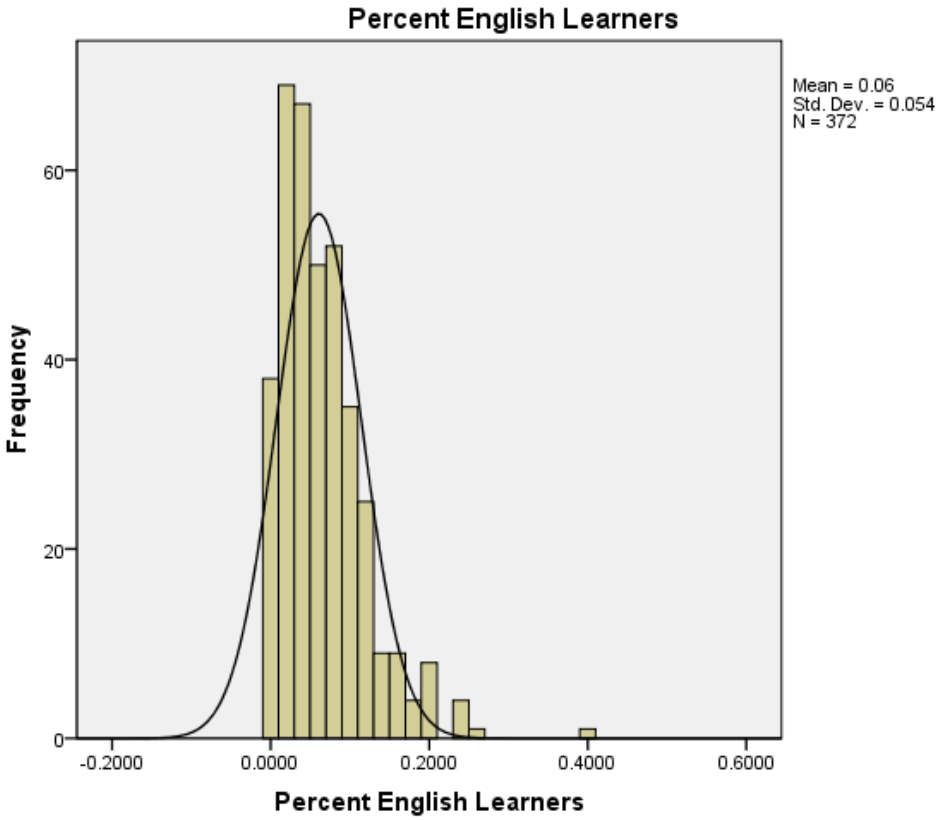
100
50
0
-0.2000
0.0000
0.2000
0.4000
0.6000
0.8000
1.0000
Percent Black or African American


Percent English Learners
Mean = 0.06
Std. Dev. = 0.054
N = 372
Frequency
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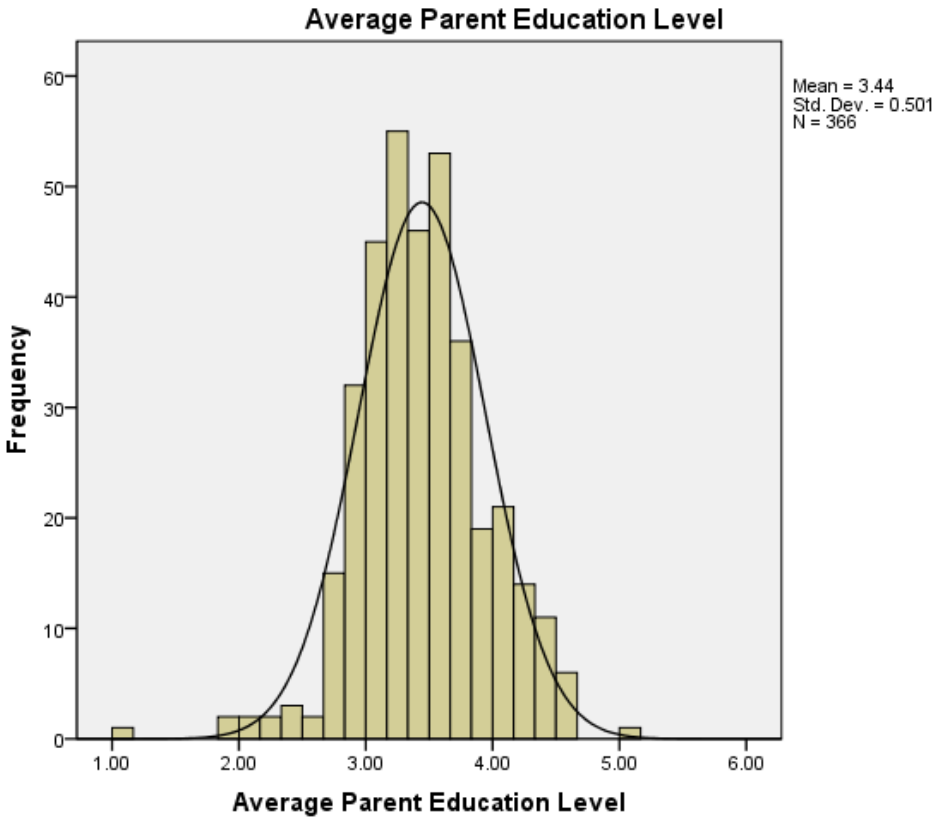
0
-0.2000
0.0000
0.2000
0.4000
0.6000
Percent English Learners


Average Parent Education Level
Mean = 3.44
Std. Dev. = 0.501
N = 366
Frequency
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50
40
30
20
10
0
1.00
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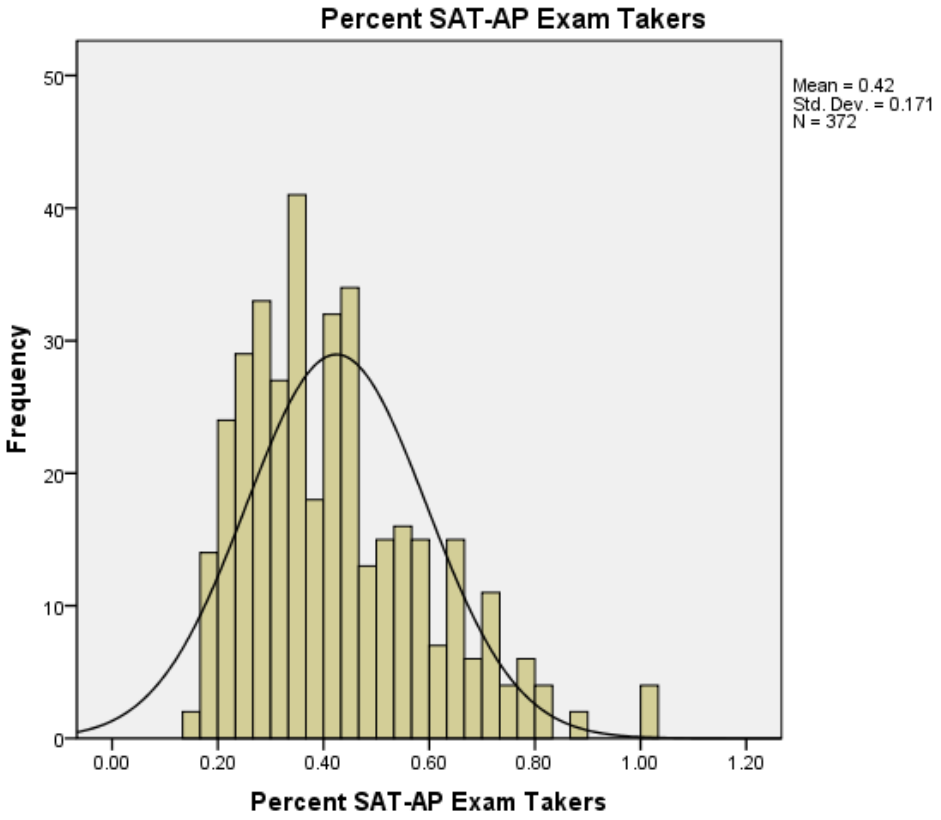
3.00
4.00
5.00
6.00
Average Parent Education Level


Percent SAT-AP Exam Takers
Mean = 0.42
Std. Dev. = 0.171
N = 372
Frequency
Percent SAT-AP Exam Takers
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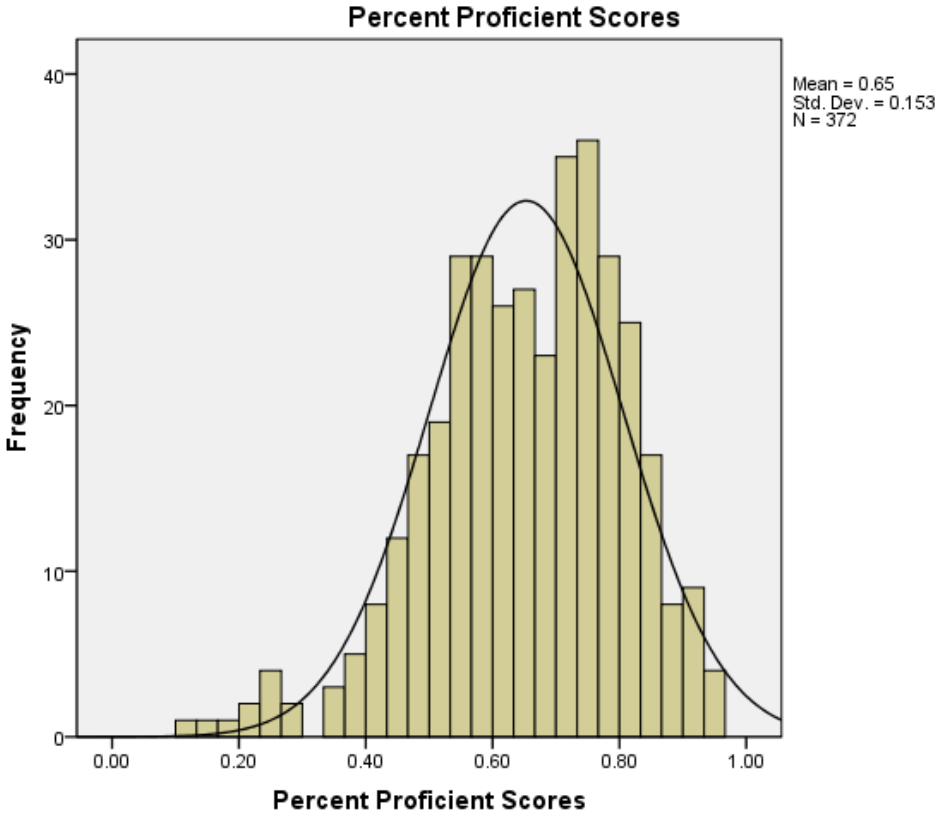
30
40
50
0.00
0.20
0.40
0.60
0.80
1.00
1.20


Percent Proficient Scores
Mean = 0.65
Std. Dev. = 0.153
N = 372
Frequency
Percent Proficient Scores
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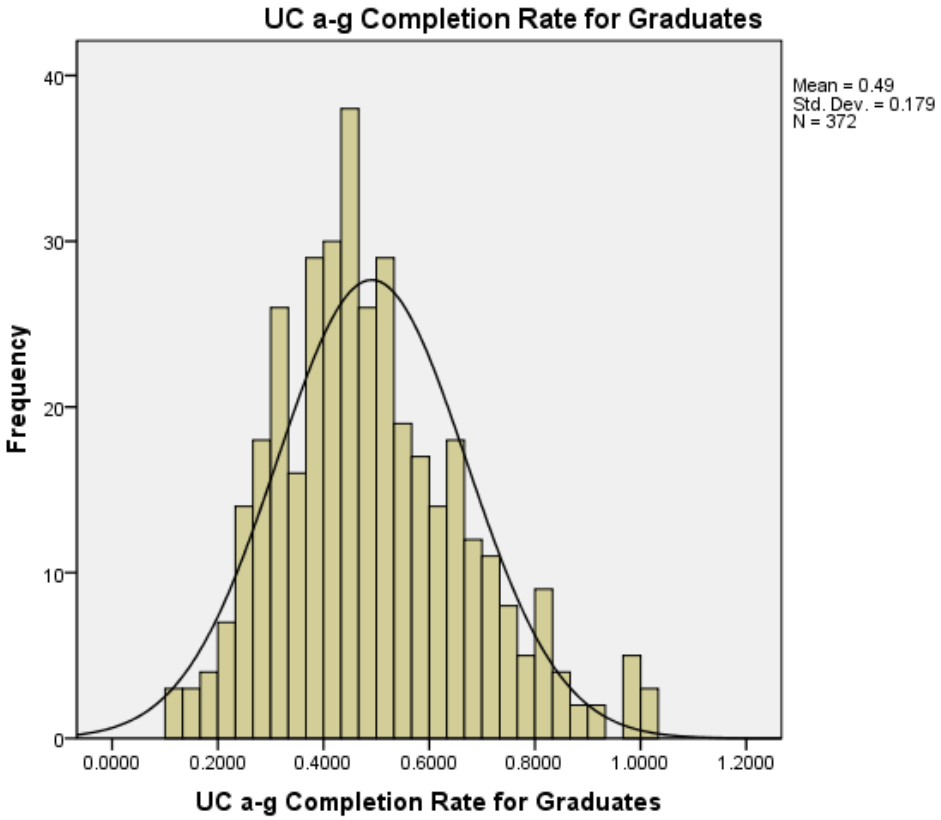
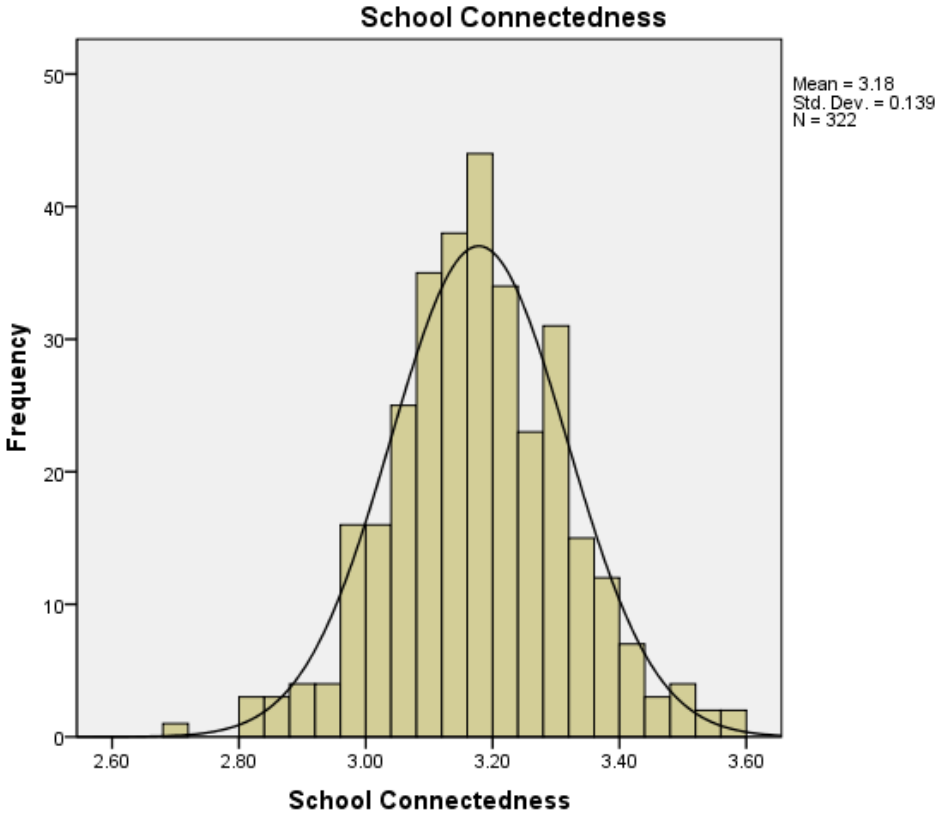
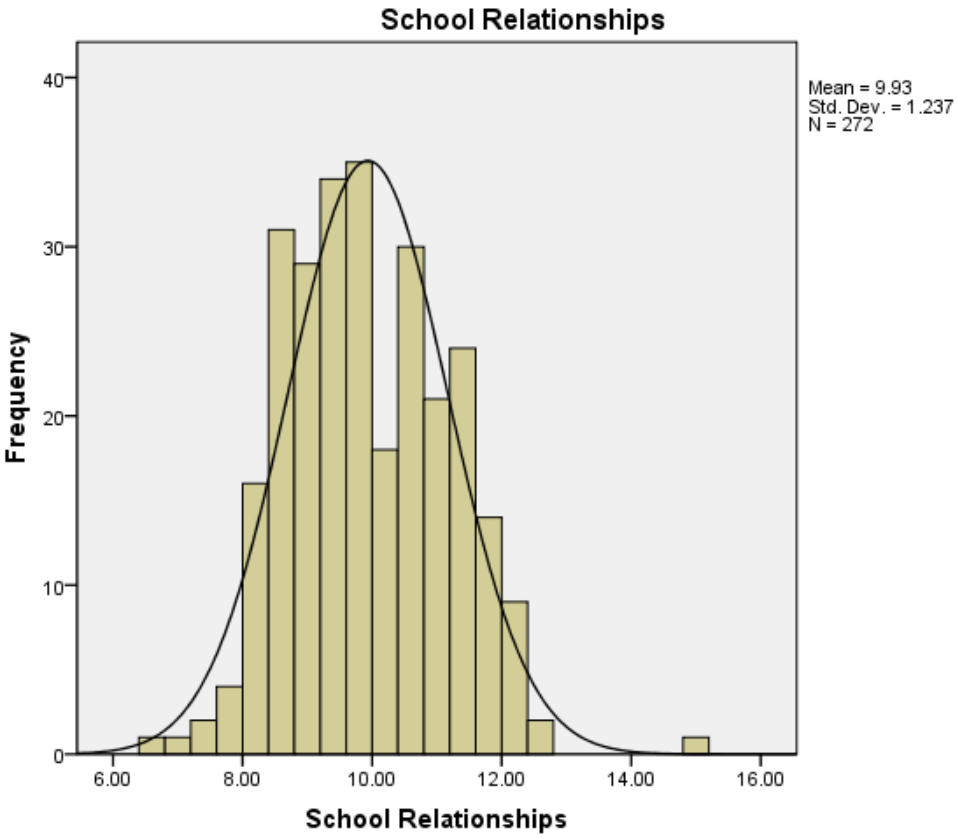
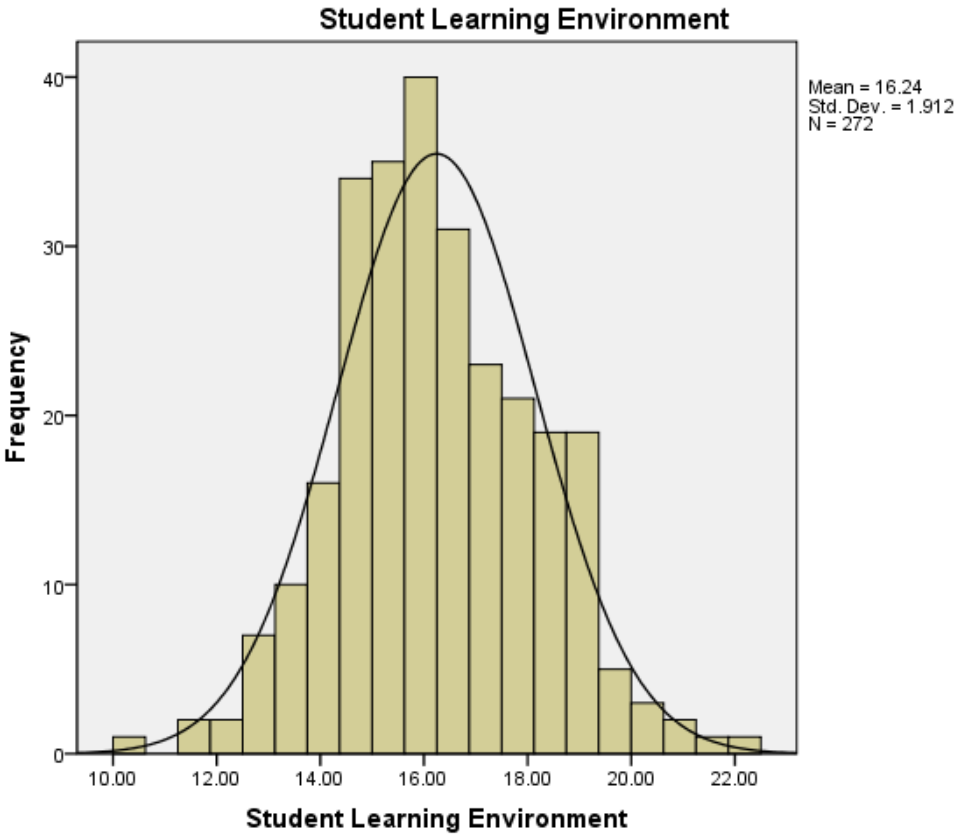
20
30
40
0.00
0.20
0.40
0.60
0.80
1.00


UC a-g Completion Rate for Graduates
Mean = 0.49
Std. Dev. = 0.179
N = 372
Frequency
0
10
20
30
40
0.0000
0.2000
0.4000
0.6000
0.8000
1.0000
1.2000
UC a-g Completion Rate for Graduates


School Connectedness
Mean = 3.18
Std. Dev. = 0.139
N = 322
Frequency
0
10
20
30
40
50
2.60
2.80
3.00
3.20
3.40
3.60
School Connectedness


School Relationships
Mean = 9.93
Std. Dev. = 1.237
N = 272
Frequency
0
10
20
30
40
6.00
8.00
10.00
12.00
14.00
16.00
School Relationships


Student Learning Environment
Mean = 16.24
Std. Dev. = 1.912
N = 272
Frequency
0
10
20
30
40
10.00
12.00
14.00
16.00
18.00
20.00
22.00
Student Learning Environment

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